ENVIRONMENTAL CONSULTING & MANAGEMENT
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ROUX

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January 25, 1999 *Sent Via Courier*

Mr. Martin T. Kotsch, Senior Project Manager
United States Environmental Protection Agency Region III
Waste & Chemicals Management Division
General Operations Branch (3WC23)
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

Re: Submittal of the Corrective Measures Effectiveness Report
Solutia Inc.; Nitro, West Virginia

Dear Mr. Kotsch:

Roux Associates, Inc., on behalf of Solutia Inc. (Solutia) is herein submitting four (4) copies of the enclosed report entitled "Corrective Measures Study Report" for the above-referenced facility. This report presents the results of stabilization/corrective measures implemented to date to fulfill the requirements of Solutia's Nitro, West Virginia facility Resource Conservation and Recovery Act (RCRA) Corrective Action and Waste Minimization Permit (Permit). Specifically, this report constitutes the Performance Evaluation element as required under the Permit and the approved Stabilization/Corrective Measures Study (SCMS) Report.

As discussed during our meeting on December 1, 1998 and upon completion of your review of the enclosed document, Solutia recommends that another project meeting be held, either in Philadelphia or at the site, to further discuss the status and future of corrective measures at the site. If you have any questions regarding the enclosed submittal or require additional information, please feel free to call me at (609) 423-8800 or Mr. Anthony Tuk of Solutia at (304) 759-4204.

Respectfully submitted,

Peter J. Palko, P.E.
Principal Engineer/Project Manager

cc: Mr. Anthony Tuk - Solutia Inc.
Mr. Nirmal Dogra - West Virginia Division of Environmental Protection
Mr. John Loper, P.E. – Roux Associates, Inc.

Enclosures

STABILIZATION/CORRECTIVE MEASURES EFFECTIVENESS REPORT

FLEXSYS NITRO PLANT

January 25, 1999

Prepared for:

SOLUTIA INC.
No. 1 Monsanto Road
Nitro, West Virginia 25143

Prepared by:

ROUX ASSOCIATES, INC.
1222 Forest Parkway, Suite 190
West Deptford, New Jersey 08066

William B. Silverstein, P.E.
Senior Engineer

Peter J. Palko, P.E., CHMM
Principal Engineer/Project Manager

Certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information including, the possibility of fine and imprisonment for knowing violations.

Permittee: Solutia Inc.

Permit No.: WVD 039990965

Facility Address: No.1 Monsanto Road
Nitro, West Virginia 25143

Name: Anthony C. Tuk

Title: Nitro Coordinator
Manager Remedial Projects

Signature: Anthony C. Tuk

Date: 1/19/99

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EXECUTIVE SUMMARY

This report presents the results of the stabilization/corrective measures implemented to date to fulfill requirements of Solutia Inc.'s (Solutia, formally Monsanto) Nitro, West Virginia facility Resource Conservation and Recovery Act (RCRA) Corrective Action and Waste Minimization Permit (Permit). Specifically, this report constitutes the Performance Evaluation element as required under the Permit and the approved Stabilization/Corrective Measures Study (SCMS) Report. This report provides an analysis of the effectiveness of remediation efforts for ground-water and light non-aqueous phase liquids (LNAPL), as well as documentation of additional closure activities associated with previously closed surface impoundment units.

Environmental investigations of the facility's fourteen solid waste management units (SWMUs) which are subject to RCRA Corrective Action were completed in 1994, and findings were presented in the approved RCRA Facility Investigation (RFI) Report and Stabilization/Corrective Measures Plan (SCMP), dated May 5, 1995 and the Addendum to the RCRA RFI and SCMP dated August 7, 1995. An evaluation and selection of remedial alternatives was provided in the Stabilization/Corrective Measures Study Report (SCMS), dated February 29, 1996 (as revised) and approved July 1, 1996.

The RFI included ground-water investigations for all but one of the SWMUs, whereas investigations of other environmental media (soil, sediment and surface water) were required at three of the 14 SWMUs. The emphasis on ground-water investigations was consistent with the Permit and was based on the findings of the RCRA Facility Assessment (RFA) completed in 1986. Ground-water quality data indicated the highest dissolved-phase concentrations of volatile organic compounds (VOCs) and base neutral/acid extractable (BN/AE) semivolatile organic compounds occurred in three primary areas of concern (AOCs). These include the following three SWMUs: the Past Disposal Area (PDA); the Trichloroethene (TCE) Hot-Spot Area; and the former City of Nitro Dump. Separate-phase product (kerosene) was also observed in monitoring wells located along the northern portion of the Past Disposal Area SWMU.

Major stabilization projects which address surficial soil sources were completed under a Consent Order with United States Environmental Protection Agency (USEPA) in the late 1980s for the Past Disposal Area and the former City of Nitro Dump. RCRA closures of four wastewater treatment/storage basins associated with the wastewater treatment plant were also completed in the late 1980s under RCR [illegible] ısive Facility Sewer System rehabilitation program is [illegible] ırate Stabilization Measures Work Plan to further ad [illegible] sult of the significant soil stabilization efforts comp [illegible] rective Action process, the focus of the selected stab [illegible] ss residual dissolved-phase concentrations in ground [illegible] ıary areas of concern. As described in this report, [illegible] physical stabilization and backfilling of basins whic [illegible] ı Status closure) were also conducted in the Basin A3 [illegible] ɜwater treatment system.

Site Specific
Priority Setting
Risk Evaluation
✓
Feb 28, 1996

To assist in the process of screening areas where further stabilization measures were not warranted and prioritizing areas where additional stabilization measures were to be implemented, the SCMS included a site-specific, risk-based prioritization assessment and ground-water/surface-water flow model. The goals of the prioritization assessment were to verify the constituents of potential concern, refine the delineation of the primary areas of concern and establish the relative priority of implementing stabilization/corrective measure technologies. The prioritization assessment was premised on the RFI findings that: (1) there is no local use of ground water or surface water for potable supply; and (2) the Kanawha River is the sole discharge point for site ground water and represents the primary receptor to be considered for protection of human health and the environment. The goals of the ground-water flow modeling were to: develop a representative, steady-state ground-water flow model; calculate ground-water flow and constituent loading rates at individual segments representative of the primary areas of concern; and predict resulting surface-water concentrations using mixing zone analyses that were consistent with West Virginia and USEPA regulations.

The prioritization assessment utilized the predicted (modeled) surface-water concentrations for identified constituents of potential concern to calculate values for incremental lifetime cancer risk, health hazard quotients/hazard indices, and ecological hazard quotients/hazard indices. The findings of the assessment, based on the continuing use of the facility as an industrial site, are summarized as follow:

- The highest calculated incremental lifetime cancer risk was 10^{-9}, three orders of magnitude below levels of potential concern;

- The highest calculated health hazard quotient was 10^{-2}, two orders of magnitude below levels of potential concern; and

- The highest calculated ecological hazard quotient was 10^{-2}, two orders of magnitude below levels of potential concern.

At the time of submission of the SCMS, the prioritization assessment concluded that the potential presence of site-related dissolved-phase constituents in the Kanawha River, due to contributions from site ground water, was not expected to have any adverse effects on human health or the aquatic species present in the Kanawha River. Similarly, the maximum detected RFI concentrations of each constituent identified in site soils/sediments and on-site surface water were screened against USEPA Region III risk-based concentration guidance and appropriate ambient water quality criteria, respectively. No constituent was present in site soil/sediment or surface water at concentrations exceeding industrial risk-based concentrations. The prioritization assessment also concluded that the site was stable and that there were no residual concentrations of dissolved-phase constituents with unacceptable risk to human health or the environment which warranted implementation of additional stabilization/corrective measures. Accordingly, no additional stabilization/corrective measures were required based on site-specific risk. However, additional stabilization/corrective measures as well as waste minimization and source control elements were pursued at Solutia's initiative to ensure that the site is maintained in a fully stable environmental condition in the future.

Stabilization/corrective activities which have been implemented to date include:

- Operation of the Past Disposal Area kerosene product/ground-water recovery system with product-recovery efforts beginning in June 1996 and ground-water pumping beginning in February 1996 (continued through April 1998);

- Implementation and operation of an interim ground-water extraction and treatment system in the TCE Hot-Spot Area and southern end of the Past Disposal Area for an operating period of up to fourteen months, with individual wells beginning operation as early as February 1997 and continuing through April 1998;

- Implementation and operation of an in-situ biosparging (oxygen injection) system in the remaining ground-water Hot-Spot area downgradient of the City of Nitro dump (operated from January 1997 to the present);

- Backfilling/restoration of Basin A3 and Digester (completed in 1997); and

- Backfilling/restoration of the Surge Basin (implemented and completed in 1998).

This Effectiveness Report provides construction documentation and performance evaluations for each of these stabilization/corrective measures. Additional stabilization/corrective measures which are currently underway on an ongoing basis include:

- complete restoration of the process sewer system component of the Facility Sewer System (expected completion 2004);

- ongoing facility waste minimization activities.

The Nitro plant has a formal, long-standing waste minimization program which targets individual waste minimization projects on a priority basis. Successfully completed waste minimization projects include an extensive upgrade of the Wastewater Treatment Plant; voluntary air emissions reductions, including participation in the Solutia Air Emissions Reduction Program, which achieved a 90% emissions reduction of Superfund Amendment and Reauthorization Act (SARA) Title III chemicals; odor abatement projects; and effluent toxicity reduction projects, among numerous additional efforts. Together, these projects have reduced the toxicity and volume of hazardous waste generated at the facility while minimizing releases to all media.

Solutia Inc. is projecting an overall investment of over $20 million to accomplish the above stabilization/corrective measures. This commitment is made in order to satisfy Solutia Inc.'s operational program as well as the RCRA Permit.

As further discussed herein, the following findings regarding implementation of stabilization/corrective measures have been observed during the performance monitoring period from 1996 to 1998:

- Kerosene product-recovery efforts in the Past Disposal Area have demonstrated that product recovery coupled with water table depression did not enhance product recovery rates;

- The ratio of apparent product thickness versus actual product thickness in the LNAPL Plume was found to be as high as 15:1 with an average apparent to actual product thickness ratio of 4:1;

- Based on the size and actual product thickness of the LNAPL plume, the estimated theoretical recovery volume ranges between 2,030 and 3,380 gallons, with an actual recoverable volume expected to be much less based on empirical data obtained from four separate product recovery systems which have been implemented at the PDA since the 1980's;

- Ground-water pumping in the PDA did not significantly increase or decrease dissolved-phase benzene concentrations in the area of pumping via a review of data collected over time from MW-7 whereby December 1998 concentrations (2.99 mg/ℓ) were basically the same as concentrations in September 1994;

- Operation of the TCE Hot-Spot Area ground-water extraction network was successful in recovering 8,909,782 gallons of ground water from the alluvial aquifer containing 164 pounds of TCE;

- Data collected from TCE Hot-Spot monitoring wells proximate to individual extraction wells were variable, with no significant increasing or decreasing trends observed during the pumping period;

- After recovery of 8,909,782 gallons of ground water, none of the extraction wells or monitoring wells yielded data indicative of any high concentration slug or evidence of instability in ground-water concentrations from the process area;

- Biosparging in the WT-14A area has been successful in reducing concentrations of constituents of concern to below permit limits as of December 4, 1998 although historical fluctuations have shown select compounds above and below permit-specified limits; and

- Basin A3/Digester and the Surge Basin have been successfully stabilized and closed in accordance with the methods outlined in the SCMS.

Based on the findings described above and outlined in more detail herein, the following recommended actions have been proposed for the corrective measures recently implemented and/or completed.

- Based on the limited extent and recoverability of existing product in the PDA as demonstrated by the use of combined product recovery/water table depression systems, continued ground-water pumping to enhance recovery has been proposed to be discontinued. However, passive product skimming has been demonstrated to be an effective means of managing the small amount of product which does collect in the wells. As such, reinstatement of passive recovery is proposed in select wells with the largest actual product thicknesses for an additional 12 month period;

- In order to achieve an 18 month operational goal in each extraction well and collect additional information in support of a petition to discontinue TCE Hot-Spot ground-water pumping operations, it is proposed that the seven TCE Hot-Spot extraction wells continue operating for an additional 12 month period. At the end of this period, the analysis provided herein will be updated and a recommendation made as to whether extraction operations should continue or be discontinued;

- Currently, no constituents of concern are in exceedance of permit-specified limits in the Nitro dump area. As such, it is proposed that biosparging in this area be discontinued to evaluate potential rebound effects which may be associated with the discontinuance of biosparging in this area. If it is determined that continued biosparging in the WT-14A area is not providing a net positive long term affect, then a decision to discontinue active treatment permanently will be made; and

- No additional activities are proposed for the basin closure areas (Basin A3/Digester and Surge Basin) beyond ongoing activities associated with stormwater flow and vegetative cap maintenance.

1.0 INTRODUCTION

1.1 Purpose

The purpose of this Effectiveness Report is to report on the implementation of the selected stabilization/corrective measures for the Solutia Inc. (formerly Monsanto) facility in Nitro, West Virginia and to recommend future steps with regard to the primary AOCs. This Effectiveness Report was developed in accordance with the February 29, 1996 "Stabilization/Corrective Measures Study Report; Monsanto Nitro Plant" (SCMS). The United States Environmental Protection Agency's (USEPA's) approval of the SCMS was received on July 1, 1996.

The Effectiveness Report is developed to fulfill the performance evaluation element as required by the approved SCMS, prepared in accordance with the facility's RCRA Corrective Action and Waste Minimization Permit (the Permit) issued on November 2, 1990 by the USEPA (USEPA ID No. WVD 033990965). The Permit addresses 14 Solid Waste Management Units (SWMUs) at the facility which are subject to RCRA Corrective Action.

1.2 Objective

The SCMS states the objective of the Final Report is to provide a "summary of stabilization/corrective measures completed, and a petition for permit modifications as appropriate." The SCMS also requires submittal of a "Ground-water and LNAPL Recovery System Performance Evaluation Report." The objective of this Effectiveness Report is to address the administrative requirements for preparation and submittal of the Performance Evaluation Report for ground-water corrective measures and the Final Report for the surface impoundment closures (Basin A3/Digester, and Surge Basin).

1.3 Report Organization

This Effectiveness Report has been organized into 10 sections. A discussion of the site history and identification of SWMUs in the Process and Waste Treatment Study areas is presented in Section 2.0. An overview of the site setting, summary of previous investigative activities, and the nature and extent of impact is provided in Section 3.0. Section 4.0 presents a summary of the site-specific Prioritization Assessment/Modeling approach that was outlined in the SCMS, along with a summary of the model's results and findings.

A description of the selected stabilization measures and their remedial objectives is presented in Section 5.0, while Section 6.0 provides a discussion of the corrective measures performance evaluation program. Finally, Sections 7.0, 8.0, 9.0 and 10.0 provide discussions of the implemented corrective measures at the Past Disposal Area, TCE Hot-Spot Area, Nitro Dump Area, and basin stabilizations, respectively.

2.0 SITE DESCRIPTION

The information discussed as part of this section includes: description of the site and surrounding land use; site history and the identification and description of the SWMUs.

2.1 Site Location and Surrounding Land Use

The Solutia Inc. (Solutia) Nitro Plant (site) is located on the east bank of the Kanawha River, approximately one-half mile north of the City of Nitro in Putnam County, West Virginia in a heavily industrialized region. A site location map from the United States Geological Survey (USGS) 7½ minute topographic quadrangle (Saint Albans) is included as Figure 1.

The site comprises approximately 116 acres. The site is divided into two study areas: a southern area (approximately 70 acres) designated the Process Study Area; and a northern area (approximately 46 acres) designated the Waste Treatment Study Area. Approximately 60 percent of the site is currently covered by production areas, warehouse buildings, parking, or open storage. The remaining 40 percent is generally unused gravel-covered or vegetated open space.

As shown on Figure 1, Interstate Highway 64 divides the facility, separating the Waste Treatment Area from the Process Area. The facility is bordered to the east and northeast by commercial properties on State Route 25. These commercial properties consist of a mobile home dealership, an electrical contracting warehouse, and a truck terminal/maintenance yard. The site is bounded to the south by industrial property. The Kanawha River borders the property to the west and northwest. The site is situated in a highly industrialized setting surrounded by other chemical manufacturing facilities with long-term occupancy history.

2.2 Site History

In 1917, the United States government awarded a contract to the Thompson Starralt Company to build a munitions plant and housing along the Kanawha River for 10,000 to 20,000 employees and soldiers in support of World War I. The munitions plant included over 730 buildings. In 1918, the Hercules Powder Company began manufacturing explosives including "nitro-powder" at the munitions plant. A town grew around the munitions plant, and the town derived its name from the principal product, "Nitro." In 1921, the plant closed due to the reduced need for its principal product at the end of World War I. The Charleston Industrial Corporation purchased the entire munitions plant and sold parcels of the facility to, among others, the Seydel Company, the Rubber Services Company, and the Nitro Pulp Company. A large number of industries grew from the individual parcels.

In 1929, Monsanto acquired the Rubber Services Company, which manufactured chloride, phosphate, and phenol compounds at the site. Operations have diversified over the years and now include production of an animal nutrition chemical in addition to rubber chemicals.

As of May 1, 1995, operation and management of the site and substantially all of its assets (except the improved real estate and certain limited manufacturing assets) were transferred to FLEXSYS America, LP (FLEXSYS), a limited partnership. In September 1997, Monsanto spun off its chemical manufacturing operations, including its interest in the Nitro facility, to Solutia Inc. The Permit has undergone Class I modifications to reflect the change in permittee status from Monsanto to both Solutia and FLEXSYS.

2.3 Identification and Description of SWMUs

The environmental and hydrogeological setting of the site, combined with the history of operations and the nature and proximity of the SWMUs, warranted the development of two Study Areas: the Process Study Area and the Waste Treatment Study Area. The demarcation of these Study Areas was approved in the RFI and is shown on the Site Plan (Figure 2).

The six SWMUs which are included in the Process Study Area are: the Past Disposal Area; the Tepee Incinerator; the Niran Residue Pits; Aboveground Equalization/Storm-Water Surge Tanks; Facility Sewer System; and the Building 46 Incinerator. The eight SWMUs which are included in the Waste Treatment Study Area are: City of Nitro Dump; Waste Pond; Decontaminated 2,4,5-T Building; Wastewater Treatment Plant (WTP); Surge Basin; Emergency Basin; Equalization Basin; and Limestone Bed. A brief description of each SWMU is provided in the SCMS and the following sections of this Effectiveness Report. The locations of the individual SWMUs in the Process Study Area and the Waste Treatment Study Area are shown on Figure 2.

Additional details pertaining to each SWMU can be found in both the RFA Report and the fact sheet prepared for the Permit. Solutia has performed extensive stabilization measures throughout the past twelve years which have addressed each of these 14 SWMUs. The measures have provided substantial stabilization of the site. In most cases, the measures were conducted on a voluntary basis and closed under State Solid Waste Programs, or under Consent Agreements with USEPA. At several SWMUs, additional stabilization/corrective measures were recommended in the SCMS and subsequently implemented under the RCRA Corrective Action process. These recently completed and ongoing corrective measures are the subject of this Effectiveness Report.

Major investigative, physical and/or closure activities associated with these SWMUs at the site are as follow:

- regrading and installation of a gravel cover at the Past Disposal Area (PDA) including areas of the Tepee Incinerator, the Niran Residue Pits and the Aboveground Equalization/Storm-Water Surge Tanks;
- decommissioning and removal of the Tepee Incinerator;
- verification investigation of the building 46 incinerator;
- interim stabilization/corrective measures for the removal of separate-phase kerosene product (further described herein);
- implementation of an Interim Hot-Spot ground-water extraction system in the TCE Hot-Spot area (further described herein);
- regrading and capping of the City of Nitro Dump;
- implementation of in-situ ground-water treatment pilot program near the City of Nitro Dump (further described herein);

- closure of the Waste Pond;
- decontamination and demolition of the 2,4,5-T Building;
- closure of Basin A3 and Digester of the WTP (further described herein);
- closure of the Surge Basin (further described herein);
- closure of the Emergency Basin;
- closure of the Equalization Basin; and
- closure of the Limestone Bed.

The above stabilization measures have served to greatly minimize impact from former operations at the site.

2.3.1 Process Study Area SWMUs

As previously described, the Process Study Area is the 70 acres which occupy the southern portion of the site and contains six SWMUs as discussed below.

2.3.1.1 Past Disposal Area

The Past Disposal Area (PDA) SWMU occupied a portion of a triangular piece of land covering approximately 5.7 acres in the northern part of the Process Study Area adjacent to the Kanawha River. The unit historically was used for on-site disposal. The unit currently contains the site of the former Tepee Incinerator, the Niran Residue Pits, and the Aboveground Equalization/Storm-Water Surge Tanks, which are also designated as additional SWMUs.

Currently, the area is an open gravel-covered area, with part of the area being used for storage of machinery and assorted parts. Surface-water runoff is directed to a drainage swale on the eastern edge of the unit. A water-filled depression is located in the central part of the PDA. The depression is associated with the concrete foundation of a former structure. Separate-phase product (kerosene) has been observed in monitoring well MW-7 and other wells located within the immediate area. This product is believed to be related to a former underground storage tank

(UST) previously located proximate to well MW-7. Two small-scale, separate-phase product recovery systems were installed in the late 1980s to remove the kerosene, but are no longer operational and have been removed. A stabilization program to re-initiate the recovery of the kerosene was presented in the RFI/SCMP Addendum (Roux Associates, Inc., 1995b) and the SCMS. As described below, this measure has now been implemented.

The PDA SWMU was originally closed in 1985 as part of a Consent Agreement with USEPA Region III (III-85-17-DC). Stabilization measures to close this SWMU have included regrading and capping of the area with gravel. As indicated in the RFI/SCMP Addendum and the SCMS, Solutia has recently implemented a stabilization/corrective measure to recover kerosene at this location. The corrective measure consists of a four-well network for kerosene recovery. Each extraction point included a pneumatically-operated, positive displacement total fluids pump. Extracted fluids were passed through an aboveground oil/water separator prior to treatment at the facility's WTP. The system comprises one of the three main corrective measures implemented for site ground water. A description of the objectives, installation, operation and performance evaluation for this system are presented later in this report (Section 7.0).

2.3.1.2 Tepee Incinerator

The Tepee Incinerator was located near the Kanawha River within the boundaries of the PDA. The unit was operated between 1958 to 1962 to burn plant trash and rubbish. Waste materials containing hazardous constituents are not known to have been burned in the incinerator.

Following the cessation of operation in 1962, the Tepee Incinerator was decommissioned and removed. The former area where the incinerator was located has been regraded and remains as open unused space. The area is currently gravel-covered. The SCMS did not recommend any further action with respect to this SWMU which has been determined to be adequately addressed under the site-wide ground-water monitoring program.

2.3.1.3 Niran Residue Pits

The Niran Residue Pits SWMU was located within the boundaries of the PDA. No facility records were maintained as to the nature and quantities of hazardous materials disposed in this area. Niran was formerly used as a broad spectrum insecticide consisting of 2,4,5-trichlorophenol and other related compounds.

The area surrounding the former Niran Residue Pits has been covered and regraded to manage surface water flow as part of the PDA stabilization measures. This area is currently gravel-covered. As with the Tepee Incinerator, the SCMS did not recommend any further action with respect to this SWMU, which is also addressed under the site-wide ground-water monitoring program.

2.3.1.4 Aboveground Equalization/Storm-Water Surge Tanks

This SWMU was constructed in 1990, and consists of four equally-sized, 82-foot diameter steel tanks with a combined storage capacity of 4.8 million gallons. This SWMU is located within the PDA. The tanks are used for storage of nonhazardous wastewater, and provide a means to equalize flow prior to discharge to the facility's WTP. This SWMU has never received hazardous waste.

The regrading and gravel cover performed in 1985 as part of the former stabilization of the PDA also regraded and covered the area of the current Aboveground Equalization/Storm-Water Surge Tanks. The tanks were constructed subsequent to stabilization of the area and received only nonhazardous wastewater. Each tank is situated atop concrete slab foundations and has a synthetic liner beneath the bottom with leak detection capability. The SCMS did not recommend any further action with respect to this SWMU.

2.3.1.5 Facility Sewer System

The facility sewer system has been in operation since the plant began production around 1918. This SWMU drains process wastes, sanitary wastes, and storm-water runoff from the site. The facility sewer system contains an extensive network of piping, constructed of various materials. The total length of the sewer system is estimated to be approximately 6,000 linear feet. The sewer system also consists of a number of lift and pump stations which transfer the contents of the sewers to the WTP. Due to the age of some of the piping and the varied history of wastewater handled by the conveyance piping, the facility sewer system is considered a potential contributor to site constituents.

Over the years of plant operations, various portions of the conveyance piping system have been repaired or replaced as part of ongoing maintenance. Because of the importance of addressing the facility sewer system, Solutia implemented an individual stabilization program for this SWMU to expedite implementation of stabilization measures. The Sewer Stabilization Measures Evaluation Program is currently being implemented by the facility. The details of these stabilization measures are outlined in the "Sewer Stabilization Measures Evaluation Report," dated May 30, 1995 and the "Detailed Sewer Stabilization Measure Plan," dated November 27, 1996. Although stabilization of this SWMU has been segregated for expediting purposes, it remains a primary component of the site-wide stabilization program, and an updated schedule for the sewer stabilization program was most recently submitted to USEPA in the August 1998 progress report.

2.3.1.6 Building 46 Incinerator

The Building 46 Incinerator SWMU was formerly used to incinerate hazardous wastes generated at the facility and is currently used for burning Santoquin residue, a nonhazardous site waste. The unit has not accepted hazardous wastes since February 1984.

A Verification Investigation was conducted for the unit, the results of which are described in the document titled "Revised Final Verification Investigation Report, Building 46 Incinerator" prepared by Roux Associates, Inc., dated August 24, 1993. As a result of the Verification Investigation, this unit was incorporated into the RFI as a SWMU. As described in the SCMS, stabilization measures are not justified for this SWMU based on the site-specific prioritization assessment, and no further action was proposed.

2.3.2 Waste Treatment Study Area SWMUs

As previously described, the Waste Treatment Study Area is the approximately 46 acres which occupy the northern portion of the site and contains eight SWMUs as described below.

2.3.2.1 City of Nitro Dump

The City of Nitro Dump SWMU was previously an operating landfill comprising slightly less than five acres, of which approximately 50% is located on Solutia's property. The remainder of the SWMU is on property owned by the State of West Virginia, and was partially covered during the construction of Interstate Highway 64. This SWMU was in use between approximately 1929 to 1956. A number of industries and municipalities have used the unit to dispose of waste materials. The precise nature and quantity of these disposal activities are not known.

Portions of the SWMU were clay capped and vegetated as part of a major soil stabilization measure dictated by a Consent Agreement with USEPA (III-86-6-DC) in 1986. Capping included placing and compacting clay at appropriate locations and regrading of the entire area to promote proper surface-water management and to minimize surface-water infiltration. USEPA issued correspondence, dated May 5, 1986, indicating approval of the remedial action and compliance with the requirements of the Consent Order. Due to the presence of chlorinated phenols in ground water, the SCMS recommended implementation of in-situ biosparging in this area. A description of the objectives, system operation, and performance evaluation for this system are provided later in this report (Section 9.0).

2.3.2.2 Waste Pond

The Waste Pond SWMU began operation in 1973 and was at one time a part of the WTP. The SWMU was a 0.5-acre surface impoundment with the capacity to temporarily store approximately one million gallons of wastewater and sludge prior to treatment in the WTP. The pond was excavated into the native soil and is not known to have been lined or covered.

The Waste Pond was closed in 1980. Closure included backfilling the depression, clay-capping and vegetating to properly manage surface-water infiltration. The area currently exists as a grass-covered field. The SCMS did not recommend any further action with respect to this area, which has been addressed under site-wide ground-water monitoring.

2.3.2.3 Decontaminated 2,4,5-T Building

The Decontaminated 2,4,5-T Building SWMU was associated with the former production and/or storage of 2,4,5-trichlorophenoxyacetic acid (2,4,5-T), a herbicide in which the compound 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) is sometimes found as a trace impurity. The area was separated from the Kanawha River by an earthen berm.

The building was decontaminated, demolished, and buried in 1970 near the site of the Control Room of the WTP. The site is currently covered with a vegetative cover to manage surface-water infiltration. The SCMS did not recommend any further action with respect to this area, which is being addressed under the site-wide ground-water monitoring program.

2.3.2.4 Wastewater Treatment Plant

The Wastewater Treatment Plant (WTP) SWMU treats wastewater carried by the Facility Sewer System including process wastewater, sanitary wastewater, and storm-water runoff. Wastewater treatment is accomplished on site via pretreatment at particular locations in the Process Study Area with final wastewater treatment being completed at the WTP. Lift Station Number 1, the Equalization Tanks, and the diversion tank (located in the Process Study Area) are equipped with pretreatment apparatus. The WTP, which provides the principal and final treatment of all site wastewater, consists of an Activated Sludge Basin, a Secondary Clarifier, and a Tertiary Clarifier. Sludge produced from the treatment process is thickened, then removed by tanker trucks for on-site treatment by incineration in a facility boiler. The WTP operates in accordance with a National Pollutant Discharge Elimination System (NPDES) Permit No. WV000868. Treated water is discharged to the Kanawha River via permitted Outfall No. 001.

Basin A3 and the Digester were identified as parts of the WTP SWMU. Basin A3 was located to the east of the Activated Sludge Basin, had a capacity of 12 million gallons, and occupied a surface area of 160,000 square feet (800 ft. length x 200 ft. width). Historically, the unit was used as a polishing basin and reportedly did not receive hazardous wastewater. Basin A3 was used as the emergency basin until 1990 when construction of the Aboveground Equalization/Storm-Water Surge Tanks was completed. Until 1996, Basin A3 remained an open depression, was unused, and occasionally retained water from precipitation events. The SCMS recommended stabilization and backfilling of this basin. A description of the recently implemented closure of the Basin A3 and Digester is provided later in this report (Section 10.0).

2.3.2.5 Surge Basin

The Surge Basin SWMU was also formerly associated with the operation of the WTP. The Surge Basin SWMU was 360 feet long, 85 feet wide and had a capacity of 5 million gallons. The Surge Basin was lined with clay and began operations in 1963. The Surge Basin was used for storage of wastewater during times of peak flow which occurred during major storm events. The wastewater was initially considered a hazardous waste because it exhibited corrosive characteristics during several days of operation during the course of annual operations. Pretreatment equipment to adjust wastewater pH was installed in 1986 which allowed for reclassification of the wastewater as nonhazardous material. Upon closure of this SWMU under RCRA Interim Status as discussed below, the Surge Basin continued to function as part of the WTP as a non-RCRA, NPDES-permitted unit to provide additional storage capacity until 1990 when it was replaced by the Aboveground Equalization Tanks.

The Surge Basin was closed in 1986 under an approved RCRA Closure Plan. As part of closure, sampling was conducted at the bottom of the basin and indicated that corrosive material was not present in the Basin. Until 1998, the Surge Basin remained an unused, open depression which retained water during precipitation events. The SCMS recommended completion of stabilization and backfilling of this basin. A description of the recently competed closure of the surge basin is provided in Section 10.0 of this report.

2.3.2.6 Emergency Basin

The Emergency Basin SWMU was formerly associated with the operation of the WTP. The wastewater handled in the Emergency Basin was initially considered a hazardous waste because it exhibited corrosive characteristics during several days of operation each year. Pretreatment equipment to adjust wastewater pH was installed in 1986 which allowed for the reclassification of the wastewater as nonhazardous material. The SWMU began operation in 1963 and was lined with asphalt. The SWMU was approximately 385 feet long, 395 feet wide and had a capacity of approximately 10 million gallons. Upon closure, as discussed below, the Emergency Basin continued to operate as part of the WTP as a non-RCRA, NPDES permitted unit until 1990.

The Emergency Basin was closed in October 1986 under an approved RCRA Closure Plan. In 1990, sludges within the Emergency Basin were stabilized/solidified using a flyash and cement-based stabilizing agent to provide adequate structural base for backfill. The Emergency Basin was then backfilled, capped and revegetated to manage surface-water runoff. The area is currently a topographically raised area which provides positive surface-water drainage and supports vegetation. The SCMS did not recommend any further action with respect to this former basin.

2.3.2.7 Equalization Basin

The Equalization Basin SWMU was formerly associated with the operation of the WTP. The SWMU was previously 540 feet long and 137 feet wide, with a capacity of 5 million gallons and was lined with asphalt. The Equalization Basin received a slow feed of wastewater from the Emergency Basin. The wastewater handled in the Equalization Basin was initially considered a hazardous waste because it exhibited corrosive characteristics during several days of operation a year. Pretreatment equipment to adjust wastewater pH was installed in 1986 which allowed for the reclassification of the wastewater as nonhazardous material. Upon closure, as discussed below, the Equalization Basin continued to operate as part of the WTP as a non-RCRA, NPDES-permitted unit until 1989.

The Equalization Basin SWMU was closed in 1986 under an approved RCRA-Closure Plan. The closure included sampling of bottom material which indicated corrosive material was not present. Residual sludges in the Equalization Basin were subsequently stabilized in 1989 to 1990 to provide adequate structural base for backfill. The stabilization included addition of a cement-based stabilizing agent. The area was then soil-capped and revegetated to manage surface-water runoff. The area is currently a topographically raised area which supports vegetation and provides positive surface-water drainage. The SCMS did not recommend any further action with respect to this former basin.

2.3.2.8 Limestone Bed

The Limestone Bed SWMU began operation in 1977 and was formerly associated with the WTP. The SWMU was asphalt-lined and received wastewater to facilitate pH adjustment of the wastewater prior to final treatment. The area is now gravel-covered.

In December 1986, this unit was closed under an approved RCRA Closure Plan and taken out of service. As part of closure, liquids and sludges were removed by pumping and were treated at the WTP. Approximately 3,000 cubic yards of soil, sediment, and an asphalt liner were then excavated and removed for disposal off-site. The area was backfilled with clean fill and gravel. The area is currently a topographically raised gravel-covered area which provides positive surface-water drainage. The SCMS did not recommend any further action with respect to this unit.

2.4 Facility Waste Minimization Projects

The Nitro plant has a formal, long-standing waste minimization program which targets individual waste minimization projects on a priority basis. Successfully completed waste minimization projects include an extensive upgrade of the Wastewater Treatment Plant; voluntary air emissions reductions, including participation in the Solutia Air Emissions Reduction Program, which achieved a 90% emissions reduction of Superfund Amendment and Reauthorization Act (SARA) Title III chemicals; odor abatement projects; and effluent toxicity reduction projects, among numerous additional efforts. Together, these projects have reduced the toxicity and volume of hazardous waste generated at the facility while minimizing releases to all media.

Additional specific examples of waste minimization projects which have been successfully implemented during the past three (3) years (since the date of the SCMS) include:

- upgrade of the truck offloading area to provide secondary containment and reduce the risk of product loss from incidental spills and equipment;

- upgrade/provide secondary containment for all site aboveground storage tanks; and

- waste load reduction in the accelerator complex and development of additional local building waste treatments (i.e. centrifuge).

The Nitro plant continues to identify and evaluate future waste minimization opportunities. Future projects are being evaluated through the facility's formal Waste Minimization Coordination Team. The team ranks waste minimization opportunities against several priority drivers. First and foremost, any project required by current regulations must be completed by the statutory deadline. Second, projects that will be required by future regulations are considered. Factors to be considered include the volume and nature of the waste stream involved, its potential impact to human health and the environment, and the cost savings provided by minimizing the waste stream. In addition, the ability of the plant to fund the waste minimization project must be evaluated and considered. As with prior projects, these waste minimization efforts will look first towards source reduction opportunities, then recycling opportunities, and finally treatment.

3.0 SITE SETTING, INVESTIGATIVE ACTIVITIES AND EXTENT OF IMPACT

The following sections provide an overview and discussion of the site's physical setting, potential ground-water and surface-water receptor evaluation, and a summary of previous RFI and CMS activities leading up to corrective measures implementation, including a discussion of the nature and extent of potential impact. The information provided and discussed in these sections is intended to provide the necessary background information which will be utilized during discussion in later sections pertaining to the results of performance evaluation activities.

The information described below was derived from published literature, maps and reports. Additional site-specific information can be obtained in either the RFA or the RFI documents.

3.1 Topography

The site is situated on top of an alluvial terrace. The site's topography is relatively flat with total relief of less than 10 feet except along the riverbank. The riverbank is a steep slope which has a drop in elevation of between 20 and 30 feet along the riverfront. The highest elevations on the site occur at the following man-made features: the low flood control levee which parallels the river in the Process Area; and the closed impoundments in the Waste Treatment Area. A discussion of regional topography is provided in the RFI (Roux Associates, Inc., 1995).

3.2 Site-Drainage and Surface-Water Flow Pattern

The Process Study Area is largely covered by impermeable surfaces (buildings and paving), and surface-water runoff is directed and managed through site-wide catch basins. Runoff from the production areas within the Process Study Area is directed into the Facility Sewer System which discharges to the Wastewater Treatment Plant. Runoff from asphalt parking areas within the Process Study Area is directed into the storm-water sewer system which discharges to the Kanawha River following primary treatment at a localized oil/water separator. The existence and maintenance of the low levee along the Kanawha riverbank prevents overland flow from reaching the Kanawha River.

The Waste Treatment Study Area is covered mostly with vegetative cover consisting of grasses. A small portion of the Waste Treatment Study Area is covered with asphalt paving. Surface-water flow is generally overland flow, and most precipitation directly infiltrates into the soil adjacent to previously stabilized SWMUs. Generally, previous stabilization measures have aided in properly managing surface water and minimizing infiltration at individual SWMUs. Recent stabilization measures have included construction of some minor roadside ditches and culverts to prevent localized ponding of surface water, as well as a surface-water channel constructed as part of the Basin A3 closure.

Minor surficial depressions exist within the boundaries of the PDA. Standing water is intermittently observed in the surficial depressions in this SWMU. This surface water was sampled in conjunction with the RFI, and was not found to exceed permit-specified limits. Additional information regarding sampling activities and results are presented in the RFI and SCMS.

3.3 River Hydrologic Characteristics

The Kanawha River is the largest stream in West Virginia and one of the larger tributaries to the Ohio River. The Kanawha River is formed by the confluence of the New River and Gauley River at the town of Gauley Bridge in the southwestern part of West Virginia. It flows in a northwesterly direction and empties into the Ohio River at Point Pleasant, West Virginia (Price, 1960).

Major tributaries of the Kanawha River in the area include the Elk River, which enters at Charleston, and the Pocatalico River, which enters approximately 3 miles downstream from the site. Armour Creek, a smaller tributary of the Kanawha River, originates at higher elevations and enters the Kanawha Valley upstream of the site. Upon entering the valley, Armour Creek turns sharply to the north paralleling the Kanawha River, and flows several miles before joining the river one mile north (downstream) of the site. The site is located on the alluvial terrace between the Kanawha River and Armour Creek. Armour Creek is located approximately 2,000 feet east of the site.

The Kanawha River is 97 miles long and is controlled by a series of locks and dams which provide a 9-foot minimum navigation depth. The locks and dams were installed to allow transportation to service regional industry. The Kanawha River has an average slope of 0.37 foot per mile in the area adjacent to the site and maintains an average water level of 566 mean sea level (MSL) (Doll, 1960).

The average flow of the Kanawha River at Charleston, West Virginia is reported to be 9,785 million gallons per day for the period between 1939 and 1994. The 7-day, 10-year low flow ($Q_{7/10}$) is reported to be 743 million gallons per day for the period between 1924 and 1960. Based on average flowrates and river cross-section area, typical flow velocities are approximately 5,000 feet per day (COE, 1995).

Figures 3 through 6 include cross-sections of the river channel as determined from a Corps of Engineers survey of the river. The river cross-sections are consistent with site-specific river data collected in 1992 to support the NPDES permit, as well as river cross-sections indicated in regional studies. The river cross-sections indicate the channel has generally steep side slopes and relatively flat bottoms. The river bottom exists close to bedrock.

3.4 Geologic Setting

The alluvial terraces along the Kanawha River are underlain by unconsolidated alluvial deposits consisting predominantly of sand, silt and clay with minor gravel. The upper part of the alluvial deposits typically contains fine-grained silt and clay and has been identified as Zone A during the RFI. Coarse sand and gravel are often found in the lower alluvial deposits near the bedrock interface and comprise Zone B. The alluvial deposits are reported to be laterally variable over short distances due to the lenticular nature of individual beds. Published geologic reports indicate the cumulative thickness of the alluvial deposits ranges from 30 to 60 feet in the vicinity of Nitro (Wilmoth, 1966).

Bedrock in the immediate vicinity of the site consists of sedimentary rocks of the Conemaugh Group of Pennsylvanian age. This geologic unit contains an interbedded sequence of sandstone, shale and mudstone with thin beds of limestone and coal. The beds are near horizontal or gently inclined, and bedding dips generally less than 5 degrees. Bedrock encountered directly beneath the site is described in drilling logs as gray siltstone. Weathered bedrock encountered in boreholes is described as weathered shale or clay (Roux Associates, Inc., 1995b).

Locally, upward migration of ground water along zones of higher permeability exists. These conditions are reportedly due to the general upward vertical difference in hydraulic head in the valley bottoms, which causes a regional upward component of ground-water flow in the valleys (Doll, 1960). A site plan showing geologic transects through the site is presented as Figure 2. Figures 3, 4, 5 and 6 each show a cross-section taken approximately perpendicular to the river. The cross-sections depict the geology, ground-water flow patterns, and river bottom topography.

3.5 Site Hydrogeology

The alluvial deposits at the site contain the uppermost water-bearing body at the site. This alluvial aquifer exists under water-table (unconfined) conditions. Depth to ground water varies from approximately 15 to 30 feet below ground surface (BGS). Ground water from the site discharges to the Kanawha River. Additionally, regional studies indicate regional ground water from areas to the west of the Kanawha River discharge to the river. This provides the basis for establishing the centerline of the Kanawha River as a ground-water divide.

A second ground-water divide which separates ground water flowing to the Kanawha River and to Armour Creek occurs to the east of the site. Plate 2 of the SCMS shows the site plan, ground-water elevations, and the ground-water divides based on ground-water elevation data collected during the RFI. Table 1 summarizes site well information, including 1994 water elevations. The flow patterns depicted are consistent with a previous site study performed in 1985 (Geraghty & Miller, 1985). Additionally, seasonally collected data indicate that ground-water levels in the process area are relatively consistent over time with an overall decrease in water levels of 0.5 to 1.5 feet from September 1996 through December 1998. In the Northern area of the site, water levels have demonstrated seasonal cycles with a seasonal variability of up to 5 feet in well WT-14A. Water levels in this areas have also been decreased by 0.5 to 2.0 feet from September 1996 through December 1998.

Site wells installed in the alluvial deposits are designated as "A" or "B" wells which monitor the upper and lower zones, respectively, of the alluvial aquifer. Aquifer testing performed during the RFI included performing 21 slug tests. Analysis of the slug tests indicated hydraulic conductivities for the "A" zone vary from 0.01 feet/day to 24 feet/day across the site with a geometric mean of 1.15 feet/day in the TCE Hot-Spot Area. Hydraulic conductivities for the "B" zone vary from 2.8 feet/day to 13 feet/day across the site with a geometric mean of 6.7 ft/day (Roux Associates, Inc., 1995b). These values are consistent with laboratory permeability testing results performed on the alluvial deposits in the regional study (Wilmoth, 1966). The RFI, the previous site study, and the regional study generally show consensus that the deeper ("B" zone) hydraulic conductivity is an order of magnitude (ten times) greater than the upper ("A" zone) hydraulic conductivity.

The bedrock conveys regional ground water. Regional studies indicate the bedrock has an upward hydraulic gradient in the vicinity of the Kanawha River and that the bedrock discharges ground water to the Kanawha River and potentially to the "B" zone of the alluvial deposits. This upward gradient likely creates increased hydraulic heads in the "B" zone observed at some locations of the site.

Analysis of the cross-sections indicates the vertical hydraulic gradient within the alluvial aquifer in the central and eastern parts of the site varies generally from being slightly upward to slightly downward. One exception is Section D-D' (Figure 6) which depicts a substantial downward gradient from the "A" zone to the "B" zone in the northern waste treatment area. A likely cause of the downward gradient in this area is the existence of inactive basins (at the time of data collection during the RFI) which held water from precipitation until their recent closure in 1996 through 1998. In the western part of the site, adjacent to the Kanawha River, the vertical hydraulic gradient is slightly upward in both the "A" and "B" zones. Horizontal flow provides the most significant contribution from the alluvial aquifer to the Kanawha River. Ground-water flux from the site to the Kanawha River is calculated as 0.09 million gallons per day, and the ground-water velocity is estimated to be between 0.1 feet per day and 1.2 feet per day.

3.6 Potential Ground-Water and Surface-Water Receptors

A comprehensive review of the proximity and types of potential surface-water and ground-water users was performed to support the site-specific prioritization assessment. This review included defining the river use designated in accordance with Title 46 of the West Virginia code, which establishes rules governing the discharge of wastes into waters and establishes water quality standards for surface waters of the State of West Virginia; and file searches of local agencies which govern potable use. The results of these reviews are presented below.

3.6.1 Surface-Water Use Designation

According to the Title 46-7-1.1 of the West Virginia Code, the Solutia Nitro Plant is located within the Kanawha River Zone 1. This zone is defined as "the main stem of the Kanawha River from mile point 0, at its confluence with the Ohio River, to mile point 72 near Diamond, West Virginia". The site is located along the Kanawha River at approximately river mile 43.

Title 46-1-6 establishes criteria for general water use categories and water quality standards for the waters of the State of West Virginia. According to Title 46-1-7.2(d)(5)(a), it is further prescribed that, for Zone 1, "Water Use Category A shall not apply." Water Use Category A, according to Title 46-1-6.2, is used to describe waters, which after conventional treatment, are used for human consumption. Accordingly, the Kanawha River in the vicinity of the site is classified as the following:

- Category B-1: warm water fishery;
- Category C: water contact recreation; and
- Category E: water supply industrial, water transport, cooling, and power.

Therefore, potential receptors of impacted ground-water from the site include humans or animals which may have incidental ingestion of, or dermal contact with, the surface water of the Kanawha River.

3.6.2 Potable Water Uses

A search to identify potential receptors of ground water and surface water was performed during preparation of the SCMS, and was updated as part of this Effectiveness Report in order to ensure that there have been no significant changes in current or proposed water use. The search included contacting and obtaining relevant information regarding potential surface-water and ground-water receptors from the following local agencies:

- Kanawha-Charleston Health Department;
- Putnam County Health Department;
- West Virginia American Water Company;
- West Virginia Division of Environmental Protection, Office of Water Resources;
- West Virginia Geological and Economical Survey;
- West Virginia Department of Health and Human Resources, Bureau of Public Health, Environmental Engineering Department; and,
- West Virginia Department of Natural Resources.

From information gathered and obtained, there were no potable water supply intakes identified on the Kanawha River downstream of the site. This is consistent with the classification of Zone 1 of the Kanawha River according to Title 46 of the West Virginia Regulations. In addition, there are no known potable supply wells in the vicinity of the site which draw water from the alluvial aquifer.

3.7 Summary of Investigatory Activities

This section summarizes the previously completed RFI activities and describes the nature and extent of potential impact to the different media identified at the site. These media include ground water, soil, sediment, and surface water. The RFI Report detailed the nature and extent of impact at the site and indicated elevated levels with respect to Permit-specified limits would be addressed by a site-specific prioritization assessment. The purpose of this section is to summarize the data identified in the RFI Report which were pertinent to the development of the site-specific assessment. Additional details pertaining to investigatory activities and results can be found in the RFI Report.

3.7.1 Summary of RFI Activities

The RFI field investigations were conducted in August and September of 1994. The primary objective of the RFI was to determine the extent and characteristics of constituent impact at the site. RFI activities focused on ground water as the primary media of concern because major stabilization measures were previously completed, as discussed herein, for the other environmental media. RFI activities included: collection of soil samples at the Building 46 Incinerator; collection of riverbank soil samples along the Kanawha River; collection of sediment samples from the PDA; collection of surface-water (standing) samples from standing water in the PDA; installation of site monitoring wells and piezometers; gauging and sampling of monitoring wells; and performance of pump tests and slug tests.

3.8 Nature and Extent of Impact

Previous stabilization measures have largely addressed site soil, sediments, and surface water. During the course of the RFI, impact to soil and sediment was found to be limited and presented no appreciable health risk, as previously discussed in the SCMS and summarized herein. Further, no site surface-water analytical results were elevated with respect to Permit-specified limits. Therefore, investigative activities focused on site ground water. Investigative activities revealed that localized ground-water Hot-Spots existed at the site with elevated concentrations of limited volatile organic compounds (VOCs), namely TCE and benzene and base neutral/acid extractables (BN/AEs), namely phenols. The Hot-Spots are located within the three primary areas of concern identified in the RFI, namely, the Past Disposal Area, the TCE Hot-Spot, and the City of Nitro Dump.

3.8.1 Soil

As previously discussed, soil investigations were limited to several SWMUs during the RFI. This is primarily due to the fact that numerous investigations and soil stabilization activities have already been implemented at this facility. The RFI targeted the remaining SWMUs where soil was identified as the matrix to be investigated and included the Building 46 Incinerator (which was investigated as a follow-up to the Verification Investigation performed on July 23, 1993), and riverbank soil samples proximate to the Tepee Incinerator, Niran Residue Pits, and Past Disposal Area SWMUs. A discussion of the results of the RFI soil investigations are summarized below. Additional analytical information has been previously provided in the RFI and SCMS.

Building 46 Incinerator

Samples were analyzed for 89 Permit-specified constituents. Elevated levels with respect to Permit-specified limits were detected in nine of nine sample locations for only seven out of 89 constituents analyzed. The constituents detected at elevated levels with respect to Permit-specified limits were arsenic and beryllium (suspected background concentrations); benzo(b)fluoranthene, benzo(a)pyrene, benzo(a)anthracene, and chrysene (BN/AEs related to byproducts of combustion) (Clement, 1989); and tetrachloroethene (a VOC likely present from site industrial activities).

Riverbank Soil Sampling

As with the Building 46 incinerator, these samples were analyzed for 89 Permit-specified constituents. Elevated levels with respect to Permit-specified limits were detected in three of three sample locations for seven of 89 constituents analyzed. The seven constituents are benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, (BN/AEs related to byproducts of combustion) arsenic and beryllium (suspected background constituents).

3.8.2 Sediment

Three samples were analyzed from the PDA for 89 Permit-specified constituents. Elevated levels with respect to Permit-specified limits were detected for three of 89 analyzed constituents in all three of the samples. The three constituents were bis(2-ethylhexyl)phthalate (BN/AE related to byproducts of combustion) (Clement, 1989), and arsenic and beryllium (suspected background constituents).

3.8.3 Site Surface Water

As previously discussed, elevated levels with respect to Permit-specified limits were not detected in site surface-water samples collected in the PDA, as outlined in the RFI and SCMS. Accordingly, site surface water did not receive further consideration.

3.8.4 Ground Water

Ground-water samples were analyzed for as many as 89 Permit-specified constituents. The SCMS previously summarized the ground-water analytical results for the Process Study Area and Waste Treatment Study Area for VOCs, BN/AEs, and metals, respectively. As a result, these results have not been reiterated herein. The SCMS also summarizes the number of wells in which elevated levels with respect to Permit-specified limits were detected for both the "A" and "B" zones of the Process and Waste Treatment Areas for the Permit-specified constituents. A summary presentation of the ground-water data by Study Area is presented below.

Process Study Area

Out of 89 Permit-specified constituents, 14 VOCs, one BN/AE, and five metals were detected at elevated levels with respect to Permit-specified limits in the Process Area. VOCs are the dominant group of constituents with elevated levels. For illustration, only 4 of the 31 wells exhibited concentrations above 1 milligram per liter (mg/ℓ) for constituents with elevated levels with respect to Permit-specified limits. The four wells exhibited only TCE above 1 mg/ℓ and are generally localized.

Waste Treatment Study Area

Out of 89 Permit-specified constituents, only nine VOCs, one BN/AE, and three metals were detected with elevated levels with respect to Permit-specified limits in the Waste Treatment Area. VOCs and BN/AEs are the dominant groups of constituents with elevated levels. For illustration, only two of the 31 wells exhibited concentrations above 1 mg/ℓ. One of the two wells exhibited chlorobenzene and one of the two wells exhibited phenols and benzene above 1 mg/ℓ. The wells exceeding 1 mg/ℓ are generally localized.

The RFI identified three primary areas of concern for ground water which contained the wells exhibiting greater than 1 mg/ℓ concentrations indicated above: the TCE Hot-Spot; the Past Disposal Area; and the former City of Nitro Dump. The primary areas of concern are addressed in the site-specific prioritization assessment and ground-water/surface-water interaction model discussed in Section 4.0, and in the identification and evaluation of stabilization/corrective measures discussed in the SCMS. A site map showing the primary Areas of Concern has been included as Figure 7.

4.0 SITE-SPECIFIC PRIORITIZATION ASSESSMENT/MODEL

The RFI determined that site ground water contained constituents at elevated levels with respect to Permit-specified limits, as discussed in Section 3.0. Additionally, three primary areas of concern were defined where individual site constituents were detected in downgradient monitoring wells at concentrations exceeding 1 mg/ℓ. Elevated levels with respect to Permit-specified limits exist to a lesser extent for on-site soil and sediments. As described in the approved SCMS, a site-specific, risk-based prioritization assessment was performed to assess all media in which constituent concentrations were elevated with respect to Permit-specified limits, and to identify areas which required stabilization/corrective measures.

This section provides an brief overview of the technical approach that was used to perform the assessment as a basis for defining stabilization/corrective measures needed at the site. The assessment utilized risk-based procedures and analyses including a screening approach to identify potential receptors, exposure pathways and site-specific constituents of potential concern, as further described below. As a formal risk assessment was not a requirement of the Permit, this prioritization assessment was performed at Solutia's initiative in order to better define the scope, and relative priority of stabilization/corrective measures needs at the site. Specifically, the prioritization assessment results were used to ensure that the individual stabilization/corrective measures proposed, and the associated remedial action objectives presented, were consistent and were based on appropriate site-specific conditions for protection of human health and the environment. Once the proposed stabilization/corrective measures in the SCMS are implemented and evaluated (as depicted on Figure 8), the prioritization assessment will be modified to incorporate the updated site-specific analytical data and ultimately submitted in a final form in the Stabilization/Corrective Measures Final Report.

As the Kanawha River is the sole receptor of site ground water, development of a ground-water/surface-water interaction model was deemed an essential component of the assessment process. This model assists in the determination of potential surface-water concentrations which could result from ground-water transport of dissolved-phase constituents. The site-specific assessment was carried out for each site constituent of concern using conservatively predicted surface-water concentrations.

4.1 Overview of the Technical Approach

The goal of the site-specific prioritization assessment was to identify areas for targeting stabilization/corrective measures based on the concentrations of individual constituents identified in the RFI process. In addition, the site-specific assessment was used to establish the relative priority of implementing stabilization/corrective measures. Specifically, the assessment approach consisted of eight major steps as follow:

- identification of constituents of potential concern via a screening process;
- development of a conceptual site model to determine exposure pathways;
- development of a ground-water/surface water interaction model;
- assessment of the hazards posed by site-related chemicals;
- assessment of the toxicity of identified constituents of potential concern;
- assessment of potential current and future exposures;
- characterization of site risk; and
- performance of uncertainty analysis.

A conservative technical approach was used in developing each of the above-described steps in order to present a conservative prioritization assessment for identified constituents of potential concern. Details of the approach including an explanation of each assessment activity listed above along with key assumptions used in each step are further outlined in the SCMS.

4.2 Site-Specific Prioritization Assessment/Model Results

The site-specific prioritization assessment/model results for ground water/surface water and soil/sediments are presented in the following sections.

4.2.1 Surface Water/Ground Water

No site surface-water (standing water) samples were found to be elevated with respect to Permit-specified limits or appropriate surface-water quality criteria. This indicated that site surface water presented no appreciable risk and required no stabilization/corrective measures.

For ground water, the screening procedure identified 12 constituents of potential concern for the Process Study Area and 16 constituents of potential concern for the Waste Treatment Study Area. As discussed in the SCMS, these results were used as inputs in a ground-water/surface-water flow model in order to estimate the Kanawha River concentrations resulting from ground-water discharge from the site. Ground-water flow and dilution factor calculations for each of four model segments were provided in the SCMS as well as predicted surface-water concentrations. As indicated in the tables included in the SCMS, the following findings were established:

- ground-water flow rates for each model segment range from approximately 3,200 (Nitro Dump Area) to 45,900 gpd (TCE Hot-Spot Area). The "B" zone of the alluvial aquifer contributes approximately 85% of the total flow. The total ground-water flow from the site is approximately 73,000 gallons per day;

- dilution factors for each model segment range from approximately 4,000 to 57,000. Comparing the ground-water flow to the Kanawha River mixing flowrate (186,000,000 gallons per day, for 25% of the $Q_{7/10}$) provides a site-wide dilution factor of approximately 2,500;

- total calculated constituent loading (VOCs, BN/AEs and metals combined) into the Kanawha River is approximately 0.6 pounds per day; and

- predicted increases in surface-water concentrations range from the order of 10^{-4} to 10^{-8} mg/ℓ for VOCs/BN/AEs and 10^{-5} to 10^{-9} mg/ℓ for metals.

A sensitivity analysis was also performed to evaluate the stability of model results against variation of key input parameter values. The input parameter with the most variability is the hydraulic conductivity, which can vary by an order of magnitude. The sensitivity analysis indicates that even by altering hydraulic conductivities by an order of magnitude, predicted surface-water concentrations remain an order of magnitude below threshold levels that would indicate appreciable risk.

Predicted surface-water concentrations resulting from the identified constituents of potential concern flowing into the Kanawha River are presented in Tables 2 and 3 for the Process Study Area and the Waste Treatment Study Area, respectively. The prioritization assessment utilized the predicted surface-water concentrations to calculate values for incremental lifetime cancer risk, hazard quotients/hazard indices, and ecological hazard quotients/hazard indices, and results are summarized in Tables 4 to 6.

As indicated in the summary tables, the following findings were established for the site-specific prioritization assessment :

- The calculated incremental lifetime cancer risk (ILCR) values vary from 2.6×10^{-15} to 9.7×10^{-9}. All values are considerably below (at least three orders of magnitude) the 1×10^{-4} to 1×10^{-6} criterion conservatively considered acceptable by the American Cancer Society, the Food and Drug Administration, and the USEPA.

- The calculated hazard quotient values vary from 3.8×10^{-12} to 1.3×10^{-2}. All values are considerably below (at least two orders of magnitude) unity (one), the value considered to pose increasing concern. The calculated hazard indices vary from 2.5×10^{-6} to 1.4×10^{-2}, considerably below (at least two orders of magnitude) unity (one), the value considered to pose increasing concern.

- The calculated ecological hazard quotient values vary from 5.9×10^{-9} to 3.8×10^{-2}. All values are considerably below (at least two orders of magnitude) unity (one), the value considered to pose increasing concern. The calculated hazard indices vary from 1.3×10^{-2} to 6.5×10^{-2}, considerably below (at least two orders of magnitude) unity (one), the value considered to pose increasing concern.

4.2.2 Soil/Sediments

The organic and inorganic constituents detected in Building 46 Incinerator soils samples were screened according to the procedures described in the SCMS. No VOCs were retained from the screening. Only arsenic and benzo (a) pyrene were initially retained from the screening. These two constituents were further considered and the results were presented in the SCMS. Based on these results, no additional stabilization/corrective measures were proposed for on-site soils and sediments beyond what had been previously performed under other closure actions.

4.2.3 Summary

The findings of this assessment indicated that the presence of site-related constituents in the Kanawha River is not expected to have adverse effects on human health or the aquatic species present in the Kanawha River. In fact, even in the three identified residual ground-water Hot-Spot areas, the calculated site-specific ILCR levels were several orders of magnitude below criteria conservatively considered to be acceptable. Similarly, the maximum observed site soil/sediment concentrations are at or below the most recent USEPA RBC for industrial facilities for all site-specific constituents analyzed during the comprehensive RFI. Figure 7 includes a summary of the prioritization assessment results for each area of concern.

As there are no potential threats to human health or the environment as an industrial facility, implementation of stabilization/corrective measures were not warranted on the basis of the prioritization assessment. However, stabilization/corrective measures were also evaluated on the basis of constituent mass removal and pathway elimination as later described herein.

5.0 DESCRIPTION OF SELECTED STABILIZATION/CORRECTIVE MEASURES

The rationale for selection of stabilization/corrective measures for soils and ground water and a description of the selected measures was presented in the SCMS. A summary of the selected Stabilization Measures is presented as Figure 8. The initial development of stabilization/ corrective measures was focused on technical effectiveness, feasibility and implementability. Each selected stabilization/corrective measure was then evaluated against additional USEPA modification criteria as described in the SCMS. The following sections present the overall approach to corrective measures implementation and a summary of the corrective measure objectives.

5.1 Overall Approach to Corrective Measures

Based on data developed during the RFI and screening of SWMUs and technologies presented in the SCMS, an overall corrective measures approach was developed. This approach focused primarily on reduction of contaminant mass in identified Hot-Spot areas to the extent practicable, combined with intrinsic remediation and long term monitoring. In order to ensure the overall stability of site conditions, additional stabilization measures focused on limiting the potential for surface infiltration through waste disposal areas, and elimination of the potential for ongoing releases from the facility sewer system.

5.2 Objectives for Ground Water

Based upon the results of the site-specific prioritization assessment, the overall goal of the stabilization/corrective measures for ground water was to reduce constituent mass and ensure that the site is maintained in a stable environmental condition. As described in the SCMS, current technologies are viable to reduce mobility, toxicity and volume, but may be impractical in attaining permit-specified levels. While it is desirable to improve water quality to the extent practicable, it is widely accepted by both industry and the USEPA that current technology is limited in achieving these standards. There are many site-specific conditions which support the technical limitations of achieving stringent ground-water quality standards as previously discussed in the SCMS. Because of these technical limitations, stabilization/corrective measures objectives were focused on achieving technically feasible cleanup levels as evidenced by attainment of asymptotic residual concentrations when plotted against time. Additionally, alternate permit limits were deemed to be an appropriate possibility for the site and were retained for future consideration, as further discussed below.

The Proposed Subpart S to 40 CFR 264 specifies that the corrective action objectives for impacted ground water include attainment of stringent media cleanup standards, which generally are Federal or State maximum contaminant levels (MCLs), contaminant levels within the range of 10^{-4} to 10^{-6} lifetime cancer risk, or hazard index of less than one for non-carcinogens, as appropriate. The proposed rule also specifies three conditions under which attainment of stringent media cleanup standards may not be required: 1) remediation of the release would provide no significant reduction in the risks to actual or potential receptors; 2) the release does not occur in, or threaten, ground water that is a current or potential source of drinking water; and 3) remediation of the release to media cleanup standards is technically impracticable.

Additionally, the preamble to the Proposed Subpart S Rule states that "alternative levels protective of the environment and safe for other uses could be established for ground water that is not an actual or reasonably expected source of drinking water." As the shallow site ground water is not a reasonable expected source of drinking water, alternate permit limits may be pursued in order to quantitatively establish the appropriate levels for permit modification purposes.

In accordance with USEPA guidance documents, alternate limits can only be used as cleanup levels when the following three conditions are met:

- The ground water has known or projected points of entry into surface water, which is a reasonable distance from the facility boundary;

- There will be no statistically significant increase at the 95% upper confidence level of constituent concentrations occurring in the surface water in the discharge zone or at any point where constituents are expected to accumulate; and

- Institutional controls will be implemented that will preclude human exposure to ground-water constituents between the facility boundary and the point of entry into the surface water (USEPA, 1988).

This approach is reasonable and appropriate because each of these conditions is satisfied at the site. Based on performance evaluations of similar installed ground-water remediation projects and preliminary data generated from currently operating systems, a Technical Impracticability Waiver may also be appropriate for this site.

5.3 Objectives for Separate-Phase Kerosene Product Area

The technical feasibility of recovering separate-phase product is primarily constrained by the specific gravity and viscosity of the product, and the soil matrix. For the Past Disposal Area of concern, the observed kerosene characteristics supported recovery via extraction; however, the fine-grained, low permeability soils were thought to inhibit total recovery. Because of the technical limitations associated with complete removal of product from these soil types, recovery objectives were focused on achieving asymptotic levels of product recovery versus time.

5.4 Objectives for Basin A3 and Surge Basin

These former basins were not reported to contain any hazardous wastes and as a result should not have elevated concentrations of site constituents relative to Permit-specified levels. For these basins, the remedial objective was to remove the potential migration pathway of surface-water infiltration for protection of site ground water.

5.5 Summary of Selected Stabilization/Corrective Measures

As described in the SCMS, the following stabilization/corrective measures were selected:

- Implement ground-water extraction and treatment at the PDA, combined with operation of a separate-phase kerosene product recovery in the vicinity of monitoring well MW-7;

- Implementation of a ground-water extraction and treatment system at the TCE Hot-Spot;

- Implementation of an in-situ biosparging system at the Nitro Dump Area;

- Backfilling/restoration of the remaining depression within the Surge Basin;
- Backfilling/restoration of Basin A3 and the Digester;
- Completion of the Facility Sewer System stabilization program;
- Ongoing facility waste minimization efforts; and
- Long-term monitoring of intrinsic remediation at non Hot-Spot areas.

The selected remedial approach for the three primary areas of concern included: the implementation of deed notices to restrict site and/or ground-water use; the routine monitoring of ground-water quality; and treatment of ground water from Hot-Spot areas for constituent mass reduction purposes. Implementation of deed notices involves administrative and legal proceedings to modify the deed. Intrinsic remediation combined with long-term monitoring was the selected remedial approach for non Hot-Spot ground-water areas.

The corrective measures indicated were designed to stabilize potentially remaining residual source areas at the site and provide a high level of protection of human health and the environment. As is evident in Figure 8, the combination of former (pre-SCMS) and current stabilization/corrective measures provides for a comprehensive site-wide remedial approach for all media and SWMUs identified in the facility Corrective Action Permit.

The selected stabilization/corrective measures listed above are described in detail in Sections 7.0 through 10.0. Each section addresses one of the corrective measures listed, and describes the objective, remedial system description, system installation, system operation, monitoring and performance evaluation, as appropriate.

6.0 SUMMARY OF PERFORMANCE EVALUATION PROGRAM

As described in the SCMS, the selected LNAPL and ground-water stabilization/corrective measures were to be operated to maximize the effectiveness of constituent mass reduction in the three primary areas of concern. In conjunction with system operation, a performance monitoring program was implemented. The purpose of this program was to monitor and optimize the effectiveness of the systems on an ongoing basis, as well as to provide selected operational and ground-water quality data as necessary to conduct a comprehensive performance evaluation. The effectiveness monitoring program involved data collection, performance monitoring, and performance evaluation as described in the following sections.

6.1 Data Collection

Data gathering was performed concurrently with system operations, as well as during pre-operation and post-operation periods. The objectives of data gathering activities were to:

- monitor the effects of the remediation systems within the primary areas of concern;
- monitor water-level elevations and evaluate influence zones at defined extraction rates;
- evaluate if additional procedures were necessary to augment system performance; and
- determine if technically feasible mass reductions or separate-phase recovery rates could be achieved.

All data collected during data acquisition is incorporated into the comprehensive performance monitoring program as presented below and in later sections of this report.

6.2 Performance Monitoring Program

A performance monitoring program was implemented to track the progress of each full-scale ground-water stabilization/corrective measure and provide a contingency plan trigger for re-evaluation of the system performance against it's remedial action objectives. The performance monitoring program included:

- routine gauging of site-wide ground-water monitoring wells and piezometers to determine hydraulic influence of individual extraction wells;

- periodic sampling of ground water from the extraction wells to determine constituent mass removed;

- routine ground-water monitoring program designed to track water quality changes at a given frequency;

- supplemental data acquisition for the proposed biosparging program; and

- a comprehensive data evaluation program designed to evaluate actual performance against expected system performance.

The overall ground-water monitoring program used for performance evaluations of the individual ground-water stabilization/corrective measures, as specified in the SCMS, is further presented below with additional detail provided in Sections 7.0 through 9.0.

Well Location	Rationale/Purpose	Indicator Constituent	Analytical Method
TCE Hot-Spot Areas			
MW-1A/B	Background	TCE	USEPA Method 8240
MW-5A/B	Hot-Spot	TCE	USEPA Method 8240
MW-20A/B	Hot-Spot	TCE	USEPA Method 8240
MW-23A	Hot-Spot	TCE	USEPA Method 8240
Nitro Dump Area			
WT-15A	Background	Benzene/Phenols	USEPA Methods 8240/8270
WT-14A	Hot-Spot	Benzene/Phenols	USEPA Methods 8240/8270
WT-13A	Perimeter	Benzene/Phenols	USEPA Methods 8240/8270
TD-5	Perimeter	Benzene/Phenols	USEPA Methods 8240/8270
Past Disposal Area			
MW-14	Background	Benzene	USEPA Method 8240
MW-7	Hot-Spot	Benzene	USEPA Method 8240
MW-22R	Perimeter	TCE/Benzene	USEPA Method 8240
MW-24A	Hot-Spot	TCE/Benzene	USEPA Method 8240

All ground-water analyses were performed by a certified laboratory. Field sample collection/monitoring forms and laboratory data packages for each quarterly event are provided in Appendix A. As part of the data evaluation in the following sections, ground-water depths, gradients, and analytical results are presented in tabular formats. Presentation methods such as indicator constituent trend plots, isopleth maps, and statistical analysis of constituent mass reductions are also provided, as appropriate.

The monitoring network was sampled at a quarterly frequency from September 1996 to the present in order to track and evaluate the ground-water quality and the effectiveness of the stabilization/corrective measures program. Recommendations for continued long-term ground-water monitoring, sampling frequency and targeted analytes are provided in subsequent sections of this report.

6.3 Comprehensive Performance Evaluation

As described in the SCMS, the time period for the comprehensive performance evaluation was to be selected based on satisfying the following two primary objectives:

- provide a sufficient amount of time as necessary to ensure that ground water in an upgradient defined Hot-Spot boundary location has traveled through the downgradient property boundary (ground-water flow velocities of up to 438 feet per year based on a maximum 1.2 feet/day flow velocity were reported in the SCMS); and

- provide a sufficient amount of time to collect statistically significant monitoring data which supports that asymptotic levels of either separate-phase product recovery or residual constituent mass recovery have been reached.

In light of considering both objectives and the above-described information, the comprehensive performance evaluation period was selected in the SCMS to be 18 months. The evaluation was to focus on cleanup levels which could be technically achieved within the desired time frame and propose recommendations for modification of the program as necessary. The performance evaluation was specified to include a recommendation for one of the possible options listed below.

- Continue operation and modify the remedial action objectives; or
- Discontinue operation and apply for alternative permit levels or a technical impracticability waiver.

The SCMS stated that should the performance monitoring data indicate that technically feasible constituent reductions (i.e. asymptotic levels) be reached, the option to discontinue further stabilization/corrective measures would be pursued. Similarly, the performance of the kerosene product recovery system was to be evaluated based upon analysis of the marginal rate of effectiveness. The SCMS stated that the cumulative volume of product recovered would be plotted versus time. As the slope of this curve approaches zero, this signals that the marginal rate of effectiveness of product recovery is declining and that technically feasible limits have been achieved.

Due to the timing of full-scale extraction system startup, operational changes in the LNAPL recovery systems, and the cessation of pumping on April 9, 1998 due to regulatory concerns regarding treatment of recovered ground water, some components of the corrective measures operated significantly less than 18 months. As described later, this leads to recommendations for continued operation and/or monitoring of several of the previously implemented corrective measures for a limited time in order to provide a larger data set for evaluation.

7.0 PAST DISPOSAL AREA - GROUND WATER AND KEROSENE LNAPL, DUAL-PHASE EXTRACTION AND TREATMENT

7.1 Objective

The remedial objective for the Past Disposal Area was to reduce kerosene LNAPL thickness in the vicinity of monitoring well MW-7 to the maximum practicable extent, and to reduce VOC mass (primarily TCE and benzene) in the alluvial aquifer. As described in the SCMS, the product is believed to be related to a former underground storage tank previously located proximate to the well, and limited in horizontal extent. Two separate-phase product systems were installed in the late 1980s (both in well R-2, located approximately 20 feet south of MW-7) to remove the kerosene. First, a dual-pump system incorporating a ground-water depression pump and a skimmer pump was used. The second system used a product-only pump. Each system achieved only limited product removal and was shut down. Experience with the prior systems and the limited areal extent of the product indicated that the separate-phase product was relatively immobile in the silty layer which is predominant in the upper portion of the aquifer and does not extend to the Kanawha River.

7.2 System Description

After evaluating the limited success of the previous product recovery measures, a more aggressive total fluids removal system was selected (Roux Associates, Inc., 1995b). The selected separate-phase product recovery system consisted of four (4) new six-inch diameter polyvinyl chloride (PVC) extraction wells specifically designed for total fluids (combined separate-phase product and water) recovery. The four extraction wells were located within the known area of separate-phase kerosene product, as shown on Figure 9, and were equipped with four QED Hammerhead® air-operated positive displacement submersible pumps. The air-operated submersible pumps were designed to pump both separate-phase product LNAPL, when encountered, and water to an aboveground treatment system, and were operated using self-contained level controls.

The recovered separate-phase product and ground water were processed through an aboveground oil-water separator, which allowed for the separate-phase product to be collected and stored in a 275-gallon separate-phase product storage tank for proper disposal offsite. The collected ground water was conveyed to the nearest sewer connection via an aboveground, insulated PVC force main for on-site treatment at the WTP. The existing NPDES-DSW Permit for the WTP was amended to allow for this source addition.

7.3 System Installation

System design drawings and specifications were prepared by Roux Associates, Inc., and presented in the Request for Bid for Installation of Kerosene Recovery/Treatment System (Roux 1995c). Installation of extraction wells EW-1 through EW-4 (located within the LNAPL area) and monitoring wells B-8A, B-8B and B-9 (located along the riverbank north of the LNAPL area) were installed from November 20, 1995 through December 13, 1995. Extraction wells were drilled to approximately 60 feet below ground surface (bgs) and screened from a depth of 20 feet BGS to the base of the well using 6-inch diameter wire-wound PVC screen to enable ground-water recovery from both hydrogeologic zones located beneath the area. Well construction details and well logs are provided in Appendix B. Monitoring wells were drilled to a depth of 32 feet BGS and completed with 15 feet of 4-inch diameter wire-wound PVC screen. Other existing monitoring wells used in the LNAPL recovery corrective measure included wells R-1 and R-2 (located within the LNAPL plume) and wells B-1 through B-7 (which circumscribe the LNAPL area). A summary of construction details for all wells on site is provided in Table 1. After well installation was complete, recovery system installation then proceeded during early 1996, followed by recovery system startup in February 1996.

7.4 System Operation

System operation was conducted by Potesta & Associates, with technical support from Roux Associates, Inc. Operational activities included troubleshooting, maintenance and cleaning of the pumps, as well as collecting performance monitoring data as described below. System operation was initiated on February 16, 1996. From February 16 through June 16, 1996, the pump intake levels were set deep in the wells (approximately 5 feet below the product/water interface) in order to recover dissolved phased constituents in water only (approximately four months). This period of time allowed for coordination with the facility WTP operators, as well as system shakedown, prior to pumping and separating LNAPL. On June 17, 1996, the pump intake levels were raised to intercept the kerosene/water interface and begin product recovery. From the time operations began, quantities of product recovered remained very low, and a number of actions were taken in an attempt to maximize product recovery rates during the operational period. Based on the fact that appreciable quantities of product had not accumulated in extraction wells EW-2, EW-3 and EW-4 during the initial four-month water-only pumping period, even with an induced gradient, future product recovery was also anticipated to be quite low in these areas. Data collected during this period indicated that the plume was much smaller and more localized than originally thought.

The system operated relatively consistently at the product/water interface from June 17, 1996 through September 19, 1996 (3 months), at which time system shutdown was required for major cleaning and maintenance. The total fluids recovery system only operated on a limited basis thereafter (with restricted flows and/or not all wells on line) in October and November of 1996, and from March through May of 1997 (approximately 5 more months of operation). It was believed that the lack of product recovery during this time may have been due to either fouling of the upper portion of the screen (not allowing product into the well) or the high yield of the wells. As a result of the high yield, it was not possible to achieve substantial drawdown (less than four feet) to create a substantially depressed hydraulic gradient for LNAPL to be collected. Steps taken to remedy these potential causes included resetting the pump intake elevation, inserting packers in the wells, and acid cleaning the well screens. These activities were believed to have had a short term benefit, but did not lead to any appreciable long-term product recovery. It should be noted that while well EW-1 has been observed to have up to 1.5 feet of separate phase product which tailed off to non-measurable in March 1998, wells EW-2 through EW-4 have never had any detectable product to recover, and pumping of over 500,000 gallons of water from EW-1 through EW-4 apparently did not draw product into these wells.

Additional operational activities included the installation of QED Ferret® product skimming pumps in wells B-1, B-2 and B-3 in an attempt to increase recovery rates. These pumps, which were operated from August 5, 1997 through April 9, 1998 in well B-1 and October 28, 1997 through April 9, 1998 in wells B-2 and B-3, produced the majority of the total free product collected during the operational period. In addition, a SitePro® dual phase pump system (combined water table depression/product-only skimmer pump) was installed in extraction well

EW-1 in October 1997 in an effort to increase product recovery through re-establishing ground-water drawdown, although the system was not ready for operation until April 8, 1998 due to operational/troubleshooting problems with the water table depression pump.

These systems were operated until April 9, 1998, at which time ground-water corrective measures were temporarily ceased due to regulatory agency concerns with the treatment and discharge of recovered ground water from the PDA Area.

7.5 Performance Monitoring

As mentioned in Section 6.2, a performance monitoring program was implemented to track the progress of each full-scale ground-water stabilization/corrective measure and consisted of two primary components: data collection and performance evaluation. The performance monitoring program for the LNAPL area included:

- routine gauging of LNAPL area ground-water monitoring wells and piezometers to determine apparent product thickness, as well as to determine hydraulic influence of individual extraction wells;

- a routine ground-water monitoring program designed to track water quality changes at a given frequency; and

- a comprehensive data evaluation program designed to evaluate actual performance against expected system performance.

The following sections discuss each component associated with the LNAPL performance monitoring program.

7.5.1 Data Collection

Specific data acquisition objectives for the LNAPL area were to:

- monitor the effects of the system in reduction of the thickness and areal extent of kerosene product within the LNAPL area;

- monitor water-level elevations and evaluate influence zones at defined extraction rates;

- evaluate if additional procedures were necessary to augment system performance; and

- determine if technically feasible dissolved phase mass reductions or separate-phase product recovery rates have been achieved.

The specific ground-water monitoring program used for performance evaluation of the kerosene LNAPL ground-water stabilization/corrective measure is presented below. The rationale or purpose of each monitoring well location is also provided.

Monitoring Well Location	Rationale/Purpose	Indicator Constituent	Analytical Method
MW-14	Background	Benzene	USEPA Method 8240
MW-7	Hot-Spot	Benzene	USEPA Method 8240
MW-22R	Perimeter	TCE/Benzene	USEPA Method 8240
MW-24A	Hot-Spot	TCE/Benzene	USEPA Method 8240
EW-1 through EW-4	Extraction Wells	LNAPL Thickness	Physical Measurement
MW-7, W-1, R-1, R2	Hot-Spot	LNAPL Thickness	Physical Measurement
B-1 through B-4	Hot-Spot	LNAPL Thickness	Physical Measurement
B-5, B-6, B-7	Riverbank	Water Level Only	Physical Measurement
B-8A, B-8A, B-9	Riverbank	Water Level Only	Physical Measurement

Chemical analyses of well samples (where indicated above) have been performed on a quarterly basis since September, 1996 (after approval of the SCMS). The most recent data available to date is from samples collected in the December 1998, quarterly monitoring event. LNAPL thickness measurements were performed on wells as noted on a periodic basis between quarterly events. Ground-water elevation was measured during all quarterly monitoring events, and from all wells within the LNAPL area during each periodic measurement event. A site plan showing ground-water elevations in the PDA is presented as Figure 10. Analytical results for VOC analysis of ground water from September 1996 through December 1998 are presented in Table 7 and later discussed herein. Periodic ground-water and product elevation measurements from all of the LNAPL area monitoring wells are provided on Table 8 and are later discussed in Section

7.5.2.2. Field LNAPL monitoring logs are provided in Appendix C. Trend graphs showing apparent product thickness over time are provided in Appendix D.

Product Bail-Down Tests

As an additional task, separate-phase product bail-down tests were conducted on each of the six wells in which product was typically observed. These wells included MW-7, R-2, B-1, B-2, B-3 and B-4. As wells W-1 and EW-1 had free product present in the December 22, 1998 gauging round (0.19 feet in W-1 and 1.15 feet in EW-1), it was also decided to test these wells. The purpose of these tests was to evaluate the actual separate phase product thickness within the formation, for comparison to the apparent product thickness as measured in the wells.

As described by Testa (1989) and others, free product thickness as measured in wells always overestimates the actual formation free product thickness. The difference between the depth to product and corrected depth to ground water may sometimes be used as a more realistic upper bound estimate of product thickness, but is still conservatively high. With many soil types, and particularly a fine silty material such as that present on site, the large capillary zone thickness can result in significant exaggeration of the apparent product thickness. While measurement of (apparent) free product thickness in wells is commonly used as an inexpensive method to track general trends in the areal extent and quantity of free product, these measurements of apparent product thickness can significantly overestimate the quantity of free product present by as much as one or two orders of magnitude. It is therefore important to compare these results with a more accurate measure of actual free product thickness at each well location.

The product bail-down test method used, as described by Gruszenki (1987), is similar to an aquifer slug test, and utilizes a graphical method to evaluate the actual formation product thickness. All product is bailed from the well, and the recovery of ground water and free product is monitored. The classic shape of curves produced shows the water level rising, then slowly falling. The inflection point in the curve is identified, and the product thickness is determined based on the difference between product and ground-water levels at that time. As mentioned, product bail-down tests were conducted on each of the 6 wells in the Kerosene area in which LNAPL is generally present (wells included MW-7, R-2, B-1, B-2, B-3 and B-4) plus well W-1.

However, well EW-1 did not provide useful results due to the rapid water level recovery rate in this well. Note that wells B-5, B-6 and B-7, located along the riverbank, as well as wells R-1, EW-2, EW-3 and EW-4 have never had any separate-phase product detected and were, therefore, not tested. A comparison of apparent product thickness (as measured and presented on Figure 11) and actual product thickness (based on bail-down tests and presented on Figure 12) is presented on Table 9. A discussion of calculated apparent to actual product thickness ratios is later discussed in Section 7.5.2.1. Copies of the product baildown tests and plots are included as Appendix E.

7.5.2 Performance Evaluation

The performance evaluation for the Past Disposal Area focused on two distinct areas. First, the performance evaluation focused on the effectiveness of the kerosene LNAPL system in reducing LNAPL thickness and volume. The purpose of this evaluation was to determine:

- whether the system implemented has been effective in reducing separate-phase product thickness and/or preventing migration of separate-phase product;
- whether continuing to run the recovery system will provide added benefit; and, if so
- whether any modifications to system design or operation are warranted.

Second, the performance evaluation focused on the effectiveness of the ground-water recovery portion of the system in reducing contaminant concentrations (primarily TCE and Benzene). The purpose of this evaluation was to determine:

- whether the system implemented has been effective in reducing contaminant concentrations;
- whether continuing to run the recovery system will provide added benefit; and, if so
- whether any modifications to system design or operation are warranted.

7.5.2.1 Effectiveness of LNAPL Recovery Measures

Similar to the two other free product recovery systems previously implemented on site, the LNAPL recovery corrective measure was successful in recovering only a small quantity of product (approximately 152 gallons of kerosene) over the system's operational period. Data collected through the operation of the LNAPL recovery system, in conjunction with product thickness data and known site characteristics demonstrate that remaining product is not readily recoverable. The data supports a site model in which a minimal actual formation free product thickness (0 to 6 inches), in conjunction with a large capillary zone in the silty site soil produces large (up to 2.17 feet) apparent product thicknesses as measured in wells. At the same time, bail-down tests and long-term product recovery rates demonstrate that little free product is actually present. This material is trapped in a silty matrix from which it is not readily recoverable by conventional means. The local area around MW-7 does appear to produce enough free product in some wells that continued passive recovery and/or frequent bailing may have some benefit; however, more aggressive pumping has not been shown to demonstrate added benefit during the approximately twelve-month intermittent operating period between February 1996 and May 1997.

Apparent to Actual Product Thickness Ratios

A total of 15 monitoring and extraction wells are present in the local area encompassing the LNAPL plume. Three additional wells (B-8A, B-8B and B-9) were installed in conjunction with the LNAPL corrective measure, but are located a greater distance to the north. As shown on Table 9, apparent product thicknesses (where detected) range from 0.18 feet (in well W-1) to 2.08 feet (in well B-3), with an average of 1.23 feet. The actual thicknesses as determined by completed bail-down tests conducted on the same day ranged from 0.0 feet (in well W-1) to 0.70 feet (in well R-2), with an average of 0.288 feet. As is common with many LNAPL plumes, the ratio of apparent to actual product thickness varies from approximately 2:1, where actual product thickness is greatest, to 15:1 where the least product is actually present. The overall average ratio of apparent to actual thickness (exaggeration factor), calculated as shown on Table 9, was found to be 4:1.

As with Testa (1989), de Pastrovich (1979) also describes the relationship between separate phase product density and exaggeration of apparent product thickness. The method described by de Pastrovich can be used as a tool to approximate the actual product thickness in the formation based on measured LNAPL thickness in wells. In simplified form, the exaggeration factor (C) is equal to the specific gravity of the product (P_{sg}) divided by the difference between the specific gravity for water (H_20_{sg}) and the specific gravity of the product.

$$[C = P_{sg}/(H_20_{sg} - P_{sg})]$$

The specific gravity of kerosene is reported to be in the range of 0.78 to 0.82. This gives an exaggeration factor of approximately 4. This ratio, as calculated using the de Pastrovich method, is in agreement with the site-specific exaggeration factor determined through product bail-down testing.

LNAPL Plume Extent

Figure 12 shows the limits of the LNAPL plume area, as well as actual LNAPL thickness based on the product baildown tests completed during December 1998 and January 1999. As shown on Figure 12, the LNAPL plume does not extend to the riverbank monitoring wells B-5 through B-9. This is consistent with prior data, which has never shown detectable kerosene product in any riverbank monitoring well. Wells B-1 through B-4, which circumscribe the north, east and south sides of the LNAPL area, were demonstrated to have an actual product thickness of up to 0.44 feet, where conclusive test results were obtained. However, this is far less than the apparent thicknesses frequently measured there. Based on the size and actual thickness of the LNAPL plume (as shown on Figure 12) and a typical soil porosity of 0.30, the estimated quantity of kerosene present in the subsurface is approximately 6,770 gallons. Typically, between 30 and 50 percent of free product present is considered to be recoverable, or a total of 2,030 to 3,380 gallons. As several product recovery systems have already been implemented on the site over a period of years, which have demonstrated substantial difficulty in recovery of free-phase product, the percent of recoverable product is estimated to be less in the PDA.

7.5.2.2 Effectiveness of Ground-Water Recovery Measures

Ground-water recovery efforts in the Past Disposal Area involved pumping of extraction wells EW-1 through EW-4. The primary purpose of pumping these wells was to enhance free product recovery as described above, with the additional purpose of mass removal of dissolved phase TCE and Benzene. Effectiveness monitoring data, as described above, included quarterly analysis of samples from monitoring wells MW-7 and MW-14 (the upgradient well) for benzene, as well as quarterly analysis of wells MW-22R and MW-24A for both benzene and TCE. Trend graphs depicting ground-water data from the PDA are included as Appendix F.

Monitoring well MW-7 serves as the primary Hot-Spot (dissolved phase and LNAPL) monitoring well, located between the four extraction wells. MW-22R serves as a perimeter well to the LNAPL plume, while still located within the observed benzene/TCE impacted area. Finally, well MW-24A is located at the southern tip of the Past Disposal Area benzene/TCE impacted area. It should be noted that while this well is classified as a Past Disposal Area monitoring well, it is located approximately 60 feet from the TCE Hot-Spot Area EW-5A/EW-5B extraction well pair, and serves mainly to monitor the effectiveness of the EW-5A/EW-5B pair. Detailed discussions of the results of sampling each of these wells are further described below. A summary and proposed recommendations are addressed in Section 7.6.

MW-7

Monitoring well MW-7 had benzene concentrations ranging from non-detect to 5.34 mg/ℓ during the effectiveness monitoring period, with an average concentration of 2.942 mg/ℓ. The data shows a very slight increasing trend in benzene concentration. However, this appears to be skewed by the anomalous non-detect concentration in December 1996. In fact, the December 1998 concentration of 2.99 mg/ℓ compares rather closely with the September 1994 concentration of 3.00 mg/ℓ (as reported in the SCMS) and the September 1996 value of 3.03 mg/ℓ. Data from the seven quarters from March 1997 through December 1998 shows a slight downward trend with an average concentration of 3.29 mg/ℓ, as compared to the permit limit of 0.005 mg/ℓ for benzene. Well MW-7 is located far enough north not to be affected by the TCE Hot-Spot Area extraction well capture zone. The MW-7 benzene concentration was also not significantly affected by the Past Disposal Area ground-water recovery program. This was primarily due to the limited pumping duration and low flow rate from the EW-1 through EW- extraction wells.

MW-14

Monitoring well MW-14, the upgradient well, has had non-detectable benzene concentrations during all quarterly sampling events since September 1996, with the exception of the December 1996 event. At that time, a concentration of only 0.001 mg/ℓ (one fifth of the permit limit) was detected.

MW-22R

Monitoring well MW-22R has exhibited consistently low concentrations of both benzene and TCE over the past nine quarters. Benzene concentrations have ranged from non-detect to 0.150 mg/ℓ during the effectiveness monitoring period, with an average concentration of 0.0244 mg/ℓ (within an order of magnitude of the permit limit of 0.005 mg/ℓ). The data shows a slight decreasing trend in benzene concentration as calculated over 10 quarters. After a significant decrease in benzene concentration in the December 1996 event (from 0.150 mg/ℓ to 0.021 mg/ℓ), concentrations have gradually continued to decrease to non-detect in the December 1998 event. TCE concentrations have ranged from non-detect to 0.077 mg/ℓ during the effectiveness monitoring period, with an average concentration of 0.022 mg/ℓ (also within an order of magnitude of the permit limit of 0.005 mg/ℓ). The data shows a very slight increasing trend in TCE concentration, as calculated over 10 quarters, but has demonstrated a consistently decreasing trend over the past four quarters.

MW-24A

Monitoring well MW-24A is located approximately 60 feet from TCE Hot-Spot extraction wells EW-5A and EW-5B, in an upgradient direction, and would be expected to be affected by pumping of those wells. Extraction well EW-5A operated from August 6, 1997, through April 9, 1998. Well EW-5B began operation on November 3, 1997, and also ceased pumping on April 9, 1998. Well MW-24A exhibited a slight overall decreasing trend for both Benzene and TCE as calculated over a period of 10 quarters. Upon closer review, the graph of TCE concentration with time shows a gradual decrease in concentration from 0.568 mg/ℓ to 0.431 mg/ℓ over the period from September 1996 through June 1997. After initiation of withdrawal in wells EW-5A/5B, TCE concentrations increased to 2.060 mg/ℓ. Finally, after the cessation of pumping, concentrations dropped to between 0.102 mg/ℓ and 0.2 mg/ℓ in the June 1998 through December 1998 quarters, respectively. Although the duration of ground-water withdrawal in the vicinity of well MW-24A was relatively short, the data suggests that pumping of the EW-5A/5B wells serves to draw more contaminated upgradient water past well MW-24A on the way to the extraction wells. The decrease after cessation of pumping could then be the result of recharge of cleaner water, either from deeper in the formation or from the river. Benzene concentrations demonstrated a similar, but slightly less pronounced effect.

7.6 Summary and Recommendations

Based on the limited extent, recoverability and the lack of mobility of existing product in the LNAPL areas during an intermittent twelve-month period of operation, it has been demonstrated that reinstating active product recovery in conjunction with ground-water withdrawal at this site will not increase product recovery rates or individual well yields. However, passive product skimming has been demonstrated to be an effective means of managing the small amount of product which does collect in the wells. Therefore, it is proposed to reinstate operation of passive skimming pumps and/or frequent bailing in selected wells with the largest actual product thickness without pumping ground water. It is recommended that further review of product recovery rates be conducted after an additional 12 months of operation.

In order to provide the data required to make an informed decision at that time as to whether further product skimming is warranted, it is recommended that additional performance data be collected during the next 12-month interim recovery period. This information should include:

- periodic (monthly) gauging of ground-water and product levels in all available LNAPL Area monitoring points;
- periodic (monthly) measurement of the quantity of recovered kerosene from each individual well; and

- periodic (approximately quarterly) comparison of apparent and actual product thickness based on bail-down tests.

This data will allow a more specific determination of a declining or asymptotic trend in actual product thicknesses and recovery rates, in order to establish when all practicable product recovery has been completed.

8.0 TCE HOT-SPOT AREA - GROUND-WATER EXTRACTION AND TREATMENT

8.1 Objective

The objective for the TCE Hot-Spot ground-water recovery corrective measure was to reduce volatile organic contaminant mass (primarily TCE and benzene) in the alluvial aquifer in identified Hot-Spots in the vicinity of monitoring wells MW-24A, MW-5A/5B, MW-20A/20B and MW-23A to the maximum practicable extent and demonstrate that the area local to these monitoring points would be stable under pumping conditions. The Hot-Spots are believed to result primarily from non-specific sources within the plant process area, including the facility sewer system.

8.2 System Description

The extraction system implemented in the TCE Hot-Spot Area included the installation of appropriate extraction wells proximate to the four identified Hot-Spot areas/wells listed above. Extraction well depths and screen intervals (listed on Table 1) were selected to be consistent with proximal monitoring wells. Paired extraction wells were installed at locations where paired monitoring wells exist. Additional system components consisted of extraction well pumps, conveyance piping, connection to the facility sewer and ancillary equipment such as flow meters and controls at each well location.

The collected ground water was conveyed to the nearest sewer connection via an aboveground, insulated PVC force main for on-site treatment at the WTP. The existing NPDES-DSW Permit for the WTP was amended to allow for this source addition. A site plan showing the TCE Hot-Spot remediation system is provided as Figure 13.

8.3 System Installation

System design drawings and specifications were prepared by Roux Associates, Inc. Design details for well installation and force main construction were essentially the same as those used for the LNAPL system. Because the extracted water was suitable for treatment at the facility WTP without any additional pretreatment, well discharge lines were each connected directly to the closest appropriate access point to the facility process sewer system. Extraction wells EW-5A/5B, EW-6A/6B, EW-7A/7B and EW-8 were installed from August 29 through September 11,

1996. B-Zone (deeper) recovery wells (wells EW-5B, EW-6B and EW-7B) were generally drilled to bedrock (approximately 60 feet in total depth) and screened from a depth of 20 feet BGS to the base of the well using 6-inch diameter wire-wound PVC screen. Specific construction details for each well are provided on Table 1. After well installation was completed, installation of recovery system pumps, piping and controls then proceeded, followed by recovery system startup.

8.4 System Operation

System operation was conducted by Potesta & Associates, with technical support from Roux Associates, Inc. Operational activities included startup, troubleshooting, maintenance and cleaning of the pumps, as well as collecting performance monitoring data as described below. System startup was initiated on February 13, 1997, with the start-up of recovery well EW-8, located at the south end of the site near MW-23A. Startup of wells EW-7B, EW-7A, EW-6A, EW-6B, EW-5A, and EW-5B was then conducted on separate dates ranging from March 13, 1997, through November 3, 1997. The staggered startup of individual wells was conducted in order to ensure that operation of the WTP was not affected by either the volume or quality of recovered ground-water discharged to the WTP. Water quality sampling from each recovery well, as well as the respective discharge manhole was conducted at the time of startup of each well as described in the next section.

System operation then continued, with short-term shutdown of individual wells for various mechanical maintenance, until April 9, 1998. At that time, ground-water corrective measures were temporarily ceased due to regulatory agency concerns with the treatment and discharge of all recovered ground water at the site. System operational logs noting the volume of water recovered from each well, as well as dates of significant maintenance activities, are provided in Appendix G.

8.5 Performance Monitoring

As discussed in Section 6.2 and 7.5, a performance monitoring program was implemented to track the progress of each full-scale ground-water stabilization/corrective measures system. The performance monitoring program for the TCE Hot-Spot Area included:

- routine gauging of site-wide monitoring wells and piezometers to understand on-going ground-water flow conditions;

- routine sampling of ground water from the extraction wells and select monitoring wells in order to evaluate temporal trends in water quality and to evaluate contaminant mass removal; and

- measurement of operational parameters, such as extraction rates, in order to evaluate and maintain mechanical performance.

8.5.1 Data Collection

Specific data acquisition objectives for the TCE Hot-Spot Area were to:

- monitor the effects of the system in reduction of dissolved phase constituent concentrations within the TCE Hot-Spot Area;

- monitor water-level elevations and evaluate influence zones at defined extraction rates;

- evaluate if additional procedures were necessary to augment system performance; and

- determine if technically feasible dissolved phase mass reductions have been achieved.

The specific ground-water monitoring program used for performance evaluation of the TCE Hot-Spot Area ground-water stabilization/corrective measure is presented below. The rationale or purpose of each monitoring well location is also provided.

Monitoring Well Location	Rationale/Purpose	Indicator Constituent	Analytical Method
TCE Hot-Spot Area			
MW-1A/B	Background	TCE	USEPA Method 8240
MW-5A/B	Hot-Spot	TCE	USEPA Method 8240
MW-20A/B	Hot-Spot	TCE	USEPA Method 8240
MW-23A	Hot-Spot	TCE	USEPA Method 8240

Chemical analyses of well samples have been performed on a quarterly basis since September, 1996 (after approval of the SCMS). The most recent data available to date is from samples collected in the December 1998 quarterly monitoring event. Ground-water elevation was measured during all quarterly monitoring events at all wells from which samples were collected. Analytical results for VOC analysis of ground water from September 1996 through December 1998 are presented in Table 7, included in Appendix H, and are later discussed in Section 8.5.2.1.

In addition to the monitoring network described above, samples were collected from all TCE Hot-Spot Area extraction wells for purposes of system performance monitoring. All available VOC analytical results from these wells are provided on Table 10. As shown on the table, each recovery well was sampled for the complete VOC list on its first day of operation. In some cases, individual organic constituents or the full volatile organics list were also analyzed at the time of start-up of the first recovery well (EW-8) or during subsequent recovery operations. This data was then available for use in calculation of mass removal rates from the recovery wells, as well as for use by the operators of the site WTP to monitor influent concentrations.

8.5.2 Performance Evaluation

Ground-water recovery efforts in the TCE Hot-Spot Area involved pumping of extraction wells EW-5A/5B, EW-6A/6B, EW-7A/7B and EW-8. The primary purpose of pumping these wells was to achieve mass removal of dissolved phase TCE and, where present, benzene. Effectiveness monitoring data, as described above, included quarterly analysis of samples from upgradient monitoring wells MW-1A/1B, as well as Hot-Spot monitoring wells MW-5A/5B, MW-20A/20B and MW-23 for TCE. Monitoring well data, including both contaminant concentrations and water levels was reviewed with the use of graphical, as well as statistical analysis. Graphical representations of the data for the monitoring wells including trends over time are presented in Appendix I, while trends in extraction wells are included in Appendix J. As described in Section 7.5.2.2, MW-24A, which was specified to be a part of the Past Disposal Area monitoring network, is also the closest well to the TCE Hot-Spot Area EW-5A/5B pair, and is valuable in monitoring of the TCE Hot-Spot Area recovery system. The performance evaluation presented below first considers the data collected from the TCE Hot-Spot Area monitoring network, followed by an evaluation of the extraction well operation.

8.5.2.1 Evaluation of Monitoring Well Data

The following paragraphs provide a detailed discussion regarding monitoring well concentrations over time in the TCE Hot-Spot Area. A summary and recommendations for this area are included in Section 8.6.

MW-1A/1B

Monitoring well MW-1A, the shallow upgradient monitoring well, has had no detectable TCE during 6 of the 10 quarters of effectiveness monitoring (including the last 4 quarters). The remaining points are well within the statistical confidence limits of the average concentration, with the exception of the December 1996 event, during which a TCE concentration of 0.06 mg/ℓ was detected.

MW-1B, the lower zone upgradient well, also had no detectable TCE during the last 7 quarters of effectiveness monitoring, as well as during previously reported sampling rounds in 1985 and 1994. However, at the beginning of the effectiveness monitoring period on September 25, 1996, a concentration of 0.033 mg/ℓ TCE was detected. This concentration rapidly declined over the next three quarters leading up to the June 17, 1997 quarterly ground-water sampling event.

MW-5A/5B

Monitoring wells MW-5A and MW-5B are located within approximately 20 feet directly downgradient of extraction wells EW-6A and EW-6B, and were expected to be directly impacted by recovery operations at those wells. At the beginning of the effectiveness monitoring period, well MW-5A had a record low TCE concentration of 0.186 mg/ℓ on September 9, 1996, followed by a record high of 1.7 mg/ℓ TCE. The concentration then began a downward trend over the next quarter (prior to recovery well startup), which continued for two more quarters after startup of recovery wells EW-6A/6B. The concentration then leveled off in the range of 0.7 to 0.8 mg/ℓ through June 1998, after the end of recovery operations. This level is consistent with the previously reported 1985 and 1994 data for this well. The October 6, 1998 data then showed an increase to a near record high of 1.67 mg/ℓ, with a drop to 1.16 mg/ℓ during December 1998. While the decreasing trend in TCE concentration during the recovery period is not inconsistent with positive effects of ground-water recovery, the short operational period (less than one year) and comparison with historic data indicate that this may simply represent a return to typical concentrations following a short-term high unrelated to (preceding) recovery operations.

Monitoring well MW-5B demonstrated similar trends in TCE concentration as well MW-5A during the pre- and post-recovery periods, although concentrations are generally higher than the shallow well, with an average of 2.858 mg/ℓ TCE. However, during the ground-water extraction period from May 9, 1997 through April 9, 1998, TCE concentrations continually increased to a high of 3.6 mg/ℓ on February 18, 1998.

MW-20A/20B

Monitoring wells MW-20A and MW-20B are located approximately 100 feet southwest (sidegradient) of extraction wells EW-7A and EW-7B, and were expected to be impacted by recovery operations at those wells. Monitoring well MW-20A was observed to have the most variable TCE concentration of all wells in the effectiveness monitoring program. The sawtooth graph of TCE data showed the data points to be outside the 99% confidence limits around the average of 5.37 mg/ℓ, with a range of 0.836 mg/ℓ to 9.180 mg/ℓ. It was therefore not possible to discern any apparent effect of the approximate one-year operational period of the extraction wells. Water level data do show an apparent drawdown of approximately one foot, as compared to pre- and post-pumping periods.

MW-20B was far less variable than MW-20A on a quarterly basis. After a historic high of 2.3 mg/ℓ TCE during the September 19, 1994 sampling, the concentration leveled off around 1.1 mg/ℓ for four quarters, extending through the startup of recovery operations at EW-7A/7B. The TCE concentration dropped slightly to a record low of 0.755 mg/ℓ on September 9, 1997, and then followed a slight increasing trend through the end of recovery operations. The first quarterly event after cessation of pumping showed a jump to a record high TCE concentration of 2.920 mg/ℓ on June 25, 1998. The October and December samples showed a very slight decrease. Similar to several other wells, the data could suggest the introduction of more contaminated upgradient water during the period of ground-water recovery operations. However, the data do not support a firm conclusion.

MW-23A

Monitoring well MW-23A is located approximately 10 feet from TCE Hot-Spot Area extraction well EW-8, which operated from February 13, 1997, through April 9, 1998. Statistically, MW-23A demonstrated a slight increasing trend during the effectiveness monitoring period. However, two of the three post-recovery sampling events (June and October 1998) demonstrated the highest (2.630 mg/ℓ) and lowest (1.190 mg/ℓ) TCE concentrations to date. The relatively narrow range of concentrations observed indicates that ground-water pumping did not have a significant overall effect on process area TCE concentrations.

8.5.2.2 Evaluation of Extraction Well Operation and Monitoring Data

Operation of the TCE Hot-Spot Area ground-water extraction network was generally consistent with little significant downtime for major repairs. As noted above, the period of operation of individual extraction wells ranged from as little as five months for EW-5B to 14 months for EW-8, prior to temporary cessation of extraction operations in April 1998.

As shown on Table 11, TCE concentrations were evaluated in conjunction with ground-water pumping rates to estimate the mass of TCE removed from each extraction well. Average extraction well pumping rates (based on total gallons pumped divided by the total length of the extraction period were 0.26 gpm for A-zone recovery wells and 6.26 gpm for the deeper B-zone wells. As a result, the TCE Hot-Spot Area ground-water corrective measure effectively recovered 8,909,782 gallons of ground water containing an estimated total of 164 pounds of TCE.

All seven TCE Hot-Spot Area extraction wells were analyzed for a full list of volatile organic constituents on their respective date of startup. Most extraction wells also had samples collected for a limited volatile organic parameter list on February 13, 1997, the day of startup of the first well (EW-8). Only wells EW-6A and EW-6B had additional samples collected during their subsequent operating periods. Well EW-6A was sampled approximately two months after startup, and well EW-6B was sampled one month and two months after startup. Graphs of the data for these wells (Appendix J) show no significant trend in TCE concentration during the early operational period. As noted in the recommendations below, collection of additional extraction well TCE concentration data points during the operational period for each well would have allowed for a more refined calculation, as well as a determination of the change in mass removal rates with time.

Ground-water gauging data collected during quarterly sampling events is summarized on Table 7. This data was used to prepare partial site-wide ground-water contour maps for the November 20, 1997 and December 4, 1998 quarterly events. The 1997 event (Figure 14) represents the period of maximum ground-water withdrawal during operation of all seven ground-water extraction wells. The December 1998 event (Figure 15) represents a static condition during which no ground-water withdrawal was occurring. Figures 14 and 15 demonstrate predominant on-site ground-water flow patterns similar to that observed during historical ground-water gauging events. The figures do not show the ground-water divide as observed in previous events, since fewer wells were used to prepare these Process Study Area Maps. None of the wells included in the quarterly effectiveness monitoring program are located east of the location of the ground-water divide. The number and location of wells incorporated into the quarterly gauging event did not provide sufficient resolution to identify the effect of specific pumping wells.

8.6 Summary and Recommendations

Evaluation of the effectiveness monitoring data collected from the TCE Hot-Spot Area extraction wells and monitoring well network leads to the following conclusions:

- TCE Hot-Spot Area extraction well operations were successful in recovering 8,909,782 gallons of ground water from the alluvial aquifer and approximately 164 pounds of TCE.

- Known aquifer characteristics in conjunction with system design information indicate that the extraction system should influence ground-water flow over all Hot-Spot areas (and most of the process area). However, data collected during the effectiveness monitoring period were not sufficiently detailed to make a specific determination of the zone of influence actually established.

- Data collected from monitoring wells proximate to individual extraction wells was variable, with the suggestion of increasing or decreasing trends at individual wells unable to be statistically confirmed based on the available data. The data do not demonstrate a positive effect in continued operation; however, they are also insufficient to prove that maximum practicable mass removal has been achieved.

- After recovery of 8,909,782 gallons of ground water, none of the extraction wells or monitoring wells yielded data indicative of any high concentration slug or evidence of any separate-phase TCE product in the alluvial aquifer.

Based on the above observations, and in order to observe the effects of longer-term recovery system operation, it is proposed to reinstate operation of the seven TCE Hot-Spot area extraction wells for an additional 12 month operational year. At the end of that period, the analysis provided in this report would be updated and a recommendation made as to whether extraction operations should continue or be discontinued. In order to provide the data required to make an informed decision at that time as to whether further ground-water extraction is warranted, it is recommended that additional performance data be collected during the operational period. This information should include the following:

- Quarterly monitoring of the same site-wide ground-water monitoring network as used during the effectiveness monitoring period should continue during the additional operational period.

- During each quarterly event, all site monitoring and extraction wells should be gauged (including those which are not sampled), in order to allow for a more detailed analysis of site-wide ground-water flow and influence.

- During each quarterly sampling event of the monitoring well network, all extraction wells should be sampled for volatile organic analysis, in order to allow for a more detailed analysis of mass removal trends.

These data will allow a more specific determination of a declining or asymptotic trend in actual contaminant mass removal rates, in order to establish when all practicable mass removal has been completed. Based on the data obtained to date from both extraction and monitoring wells, it is likely that upon cessation of this additional 12-month pumping period, Solutia will petition for discontinuance of perimeter pumping since it is expected that the local ground water system will have been sufficiently stressed without significantly affecting monitoring or extracted concentrations. In accordance with the SCMS, the pumping program was proposed to demonstrate that a stable environment exists, and that a significant source did not remain beneath the Process Study Area that would increase risk to potential receptors (i.e., the Kanawha River). If this continues to be the case as demonstrated by additional monitoring of process area monitoring wells, Solutia will seek approval for alternate permit levels or a technical impracticability waiver to achieve final compliance with the RCRA Permit for the site.

9.0 CITY OF NITRO DUMP AREA - IN-SITU BIOSPARGING

9.1 Objective

The remedial objective for the City of Nitro Dump Area was to reduce contaminant (benzene and phenols) mass to the maximum practicable extent local to well WT-14A. The feasibility of accomplishing this objective was proposed to be evaluated via the performance of a bench-scale treatability study (to provide proof of concept and to develop full scale design parameters), followed by a pilot field program (to verify the applicability of the process under full-scale conditions).

As described in the SCMS, the selected remedy for the Nitro Dump Area was the in-situ treatment method of biosparging. There are several reasons why biosparging was favored in this Hot-Spot area over other evaluated technologies, air sparging and ground-water extraction. First, the primary constituents of concern in this area include methyl-phenols and chlorinated phenols. These constituents have significantly lower Henry's law constant and vapor pressures than TCE and benzene. A review of published literature indicated that methyl-phenols are marginally affected via air stripping while the chlorinated phenols are clearly unsuitable for treatment via air stripping (Brown et al., 1993). Additionally, there is a notable reduction in hydraulic conductivities in the shallow zone in the vicinity of WT-14A as soil boring data indicate an increase in the predominance of fine-grained low permeability soils in the northern portion of the site. Specifically, monitoring well WT-14A has an extremely low yield, and the surrounding area was not considered suitable for effective ground-water extraction.

However, many favorable conditions were identified which support the in-situ biosparging technology selection. A literature review of the degradation data for the phenolic compounds indicates that they are biodegradable, particularly under aerobic conditions. Further, review of site-specific dissolved oxygen data indicate that ground-water dissolved oxygen concentrations were much lower for WT-14A than surrounding locations and the rest of the site. This is a strong indicator that the dissolved constituents in WT-14A are naturally biodegrading, but may be slowed by the low availability of dissolved oxygen. Published sources indicate that it is favorable to have a ratio of from 1 to 3 parts of dissolved oxygen to 1 part constituent concentrations to properly achieve bioremediation. The dissolved oxygen to constituent ratio for methyl-phenols in WT-14A was 0.8:50, far less than the favorable range. Accordingly, it was deemed likely that a biosparging system capable of increasing dissolved oxygen concentrations in the ground water at the WT-14A area would accelerate biodegradation and reduce observed phenolic compound concentrations.

An in-situ biosparging approach for destruction of the constituents in proximity to well WT-14A was selected in the SCMS. The proposed strategy for implementing biosparging at the site consisted of two phases. Phase I involved a bench scale treatability study to determine if the site specific conditions were suitable for biosparging of the constituents. Based on positive results from Phase I, Phase II consisted of the field application of the Gaseous Oxygen Injection Remediation System (GOxIRS). Each is further discussed below. Specific elements in the following program were developed in conjunction with Envirogen (Envirogen, 1996).

9.2 Bench Scale Treatability Study

Treatability studies on the degradation of the constituents at the site were performed by Envirogen using representative soil and ground-water samples obtained from the area surrounding WT-14A. Soil and ground-water samples were collected through a hollow stem auger equipped with a split-spoon sampler. The objectives of the Phase I study were to evaluate the following:

- The feasibility of aerobic degradation of the constituents in soils and ground water in the vicinity of WT-14A through column studies;

- The capability of the indigenous bacteria to completely or partially degrade the observed mixture of methyl- and chlorophenols;

- The potential biodegradation limiting factor of nutrient availability; and

- The presence of potential inhibitors to microbial activity (pH, temperature, and potential competitive inhibition).

Chloro- and methylphenols are generally known to be difficult to biodegrade aerobically. However, the laboratory bench scale feasibility study performed by Envirogen indicated that biodegradation was possible by stimulating indigenous bacteria. A copy of the Envirogen report is provided in Appendix K.

9.3 System Description

Based on the successful result of the Phase I study, which demonstrated the potential for in-situ biodegradation of the constituents at the site, the field application of a bioremediation system was initiated. From the available site data, the constituents in the vicinity of WT-14A were detected primarily in a ground-water sample, indicating that the saturated zone should be the focus of pilot testing bioremediation efforts.

The GOxIRS Field Demonstration was designed to assess the feasibility of stimulating *in-situ* aerobic biodegradation of a mixture of semi-volatile organic compounds (SVOCs) dissolved in the site ground water. The focus of the Field Demonstration was a localized area surrounding monitoring well WT-14A, which has historically exhibited ground-water constituents of concern concentrations which have exceeded 1 mg/ℓ. The source of ground-water contamination was suspected to be constituents of concern impacted soils within this "Hot-Spot". This area is located on the downgradient edge of the former City of Nitro Dump bordering the Kanawha River, located within the Solutia Nitro Plant.

9.4 System Installation

The GOxIRS system (consisting of 14 oxygen injection wells, distribution manifolding, and compressed gaseous oxygen cylinder banks) was installed around well WT-14A. Details of the injection system installation are provided in Appendix L. The objective of the GOxIRS was to elevate dissolved oxygen levels in the Site ground water within and around well WT-14A to stimulate aerobic biodegradation of the constituents of concern. A site plan showing the orientation of the pilot biosparging program is included as Figure 16.

9.5 System Operation

The system has been active since January 21, 1997 and has operated continuously since start-up. Ground-water monitoring has been conducted on a quarterly basis by Potesta & Associates. System operations and monitoring is currently being performed by Potesta & Associates with guidance from Envirogen. Overall, constituents concentrations have been shown to fluctuate, but have been on the decline since start-up of the system.

9.6 Performance Monitoring

As previously discussed in Section 6.2, performance monitoring for the City of Nitro Dump Area involved monitoring of ground water for benzene and phenols in wells WT-13A, WT-14A, WT-15A and TD-5 (see Table 12 for a summary of results). Additional data collected included dissolved oxygen and nutrient concentrations in well WT-14A, as well as field operational parameters such as oxygen flow rates and pressures.

9.6.1 Data Collection and Results Summary

The following sections present discussions of various parameters monitored during the course of the pilot program.

9.6.1.1 Oxygen Injection and Dissolved Oxygen Monitoring

The GOxIRS injected approximately 44,260 cubic feet of oxygen (3,948 pounds) into the demonstration area as of July 29, 1998 (see Table 1 of Appendix M). Dissolved oxygen (DO) levels at well WT-14A have ranged between 0.4 mg/ℓ (background) and 21.6 mg/ℓ (super saturated) as shown in Table 2 of Appendix M. Based on these results, it is apparent that oxygen is not a limiting factor for biodegradation during the course of the pilot test.

Dissolved oxygen concentrations had remained elevated (greater than 5 mg/ℓ) from startup until March 27, 1998 when DO levels began to steadily decrease in well WT-14A. In response to these observations, oxygen injection rates were increased in an attempt to maintain elevated DO levels. This action had no effect. It was suspected that the screen of the monitoring well or the sand filter pack in the well bore was clogged (i.e., biomass, silt, etc.). Therefore, oxygenated ground water from the treatment area was likely recharging the well at an insufficient rate to satisfy microbial oxygen requirements within the well. In the treatment area soils, it was suspected that oxygen injection rates were sufficient to keep up with oxygen utilization.

On April 27, 1998, the well was pumped to increase the recharge. Prior to pumping, dissolved oxygen was at 0.52 mg/ℓ. Following pumping, DO concentrations in the well averaged 15.7 mg/ℓ (high of 19.8 mg/ℓ). These results indicate that DO concentrations were elevated within the treatment area surrounding WT-14A and that either ground-water recharge within the well was impaired or oxygen was being consumed by biomass within the well bore. This was confirmed on April 28, 1998, when DO concentrations had again dropped below 1 mg/ℓ in less than 24 hours. The rate at which the dissolved oxygen was utilized within the well indicates that microbial activity is occurring within the well bore, and most likely within the treatment zone.

On May 7, 1998, well WT-14A was pumped again. However, this time, no appreciable increase in DO was detected by field instrumentation (0.43 mg/ℓ pre-development increased to 0.6 mg/ℓ). Pumping of the well was either not effective, or dissolved oxygen concentrations within the treatment area had dropped significantly. A water sample was collected during this event and was sent to a laboratory for DO and dissolved CO_2 analyses (see Table 4 of Appendix M). After purging the well, the dissolved CO_2 concentration was 12.8 mg/ℓ and the DO concentration was 7.5 mg/ℓ according to laboratory results. The laboratory DO result did not agree with the field DO measurement, indicating a possible field instrument malfunction. The presence of dissolved CO_2 indicates the presence of microbial activity.

Beginning with the DO reading taken October 27, 1998, and including all subsequent readings, the well was purged prior to taking the reading. This serves to provide a sample which is more representative of the conditions in the treatment zone surrounding well WT-14A, rather than being affected by microbial activity within the well bore itself. Measurements taken in this manner have generally shown DO levels in excess of the target level and ranged from 4.6 mg/ℓ to greater than 20 mg/ℓ. It is deemed likely that DO levels have been maintained at or near target levels throughout the pilot operation, and the low readings in April and May 1998 were not reflective of conditions within the treatment zone.

9.6.1.2 Vapor Headspace Monitoring Results

Vapor headspace measurements are shown in Table 3 of Appendix M. Pre-operational readings of carbon dioxide and methane in the vapor headspace of well WT-14A were non-detectable for CO_2 and 0.7% (by volume) CH_4. Carbon dioxide levels were highest (0.7%. CO_2) in the most recent reading on December 10, 1998. Methane levels have ranged from non-detectable to 0.7% CH_4 with no detectable methane in the most recent reading on December 10, 1998. VOC concentrations in the well headspace have generally decreased from 150 parts per million by volume (ppmv) to non-detectable levels.

9.6.1.3 pH Monitoring Results and Nutrient Analyses

The pH, as measured with field instrumentation, has averaged approximately 7.52 standard units (Table 2 of Appendix M) with a high of 8.74. Laboratory analysis results for pH range between 6.70 to 7.83 (Table 4 of Appendix M). Slightly caustic conditions could inhibit biological activity, although dissolved oxygen utilization observed in WT-14A does not suggest this is the case.

Nutrient analyses performed on WT-14A are summarized in Table 13. Laboratory results indicated that nutrients are not a limiting factor for biodegradation. This assumption is based on the detectable presence of all nutrient analytes of concern. Efficiency of biodegradation may be enhanced, however, by increased availability of nutrients.

9.6.1.4 BOD and COD Analyses

Results of biological oxygen demand (BOD) and chemical oxygen demand (COD) analyses that were performed on WT-14A and WT-13A (located approximately 440 feet southwest of WT-14A) on September 26, 1997 are summarized in Table 4 of Appendix M. The BOD and COD were low: 2 to 18 mg/ℓ, and 29 to 130 mg/ℓ, respectively. Recent BOD and COD analyses have not been performed.

The BOD results estimate the oxygen demand exerted by bacteria to aerobically degrade and biodegradable contaminants and/or constituents in the Site ground water. The COD indicates the oxygen demand via chemical oxidization of contaminants an/or constituents in the Site ground water. COD includes those contaminants/constituents that are not readily biodegradable, are only partly biodegradable, or may inhibit biological activity (i.e., components that would not be oxidized via biological reactions). The results showed that in both wells sampled, the COD is greater than the BOD. Theoretically, the difference in oxygen demand between COD and BOD concentrations is due to either the recalcitrant nature of the particular constituents of concern, or there are other constituents in the ground water that exert a chemical oxygen demand. This also may indicate that there is a potential for oxygen utilization in the Site ground water by non-biological processes (e.g., iron oxidation, etc.). However, based on dissolved oxygen levels measured at WT-14A, dissolved oxygen did not appear to be limiting oxidation processes (biological and/or chemical).

9.6.1.5 Ground-Water Monitoring

Table 12 summarizes the total SVOC and benzene concentrations measured in wells WT-13A, WT-14A, WT-15A, and TD-5 during quarterly monitoring events. As shown in the trend graphs in Appendix N, the overall trend in WT-14A, since startup of the system, indicates a general decrease in total SVOC and benzene concentrations, except for an increase in the second quarter 1997 concentrations. This trend could be an annual event based on the small increase in ground-water concentrations as observed during the second quarter 1998 sampling results, followed by a decrease in the third and fourth quarter 1998 results.

Some individual constituents of concern concentrations have continued to fluctuate over the operational period as presented in Table 13, as well as the trend graphs in Appendix N. The ground-water constituents phenol, 2,4-dimethylphenol, 2,4-dichlorophenol, 4-chloro-3-methylphenol, 2,4,6-trichlorophenol, o-, m- & p-cresol, and benzene have historically been detected in the water at WT-14A, prior to the Field Demonstration start-up. Note that the more readily degradable constituents of concern (including phenol, o-, & p-cresols) decreased in concentration more quickly than some of the more recalcitrant constituents (e.g., benzene).

9.6.2 Performance Evaluation

In reviewing the performance of the biosparging operation, an evaluation of DO versus concentration and ground-water elevation versus concentration trends was performed. Each of these areas are discussed in the following sections.

9.6.2.1 Dissolved Oxygen Trends Versus Constituents of Concern Concentrations

The changes in total SVOC and benzene concentrations are compared to dissolved oxygen trends in Figure 1 of Appendix M. Fluctuations in oxygen concentrations are likely due to several factors, including fluctuations in ground-water elevation (i.e., dilution effects), adjustments of the oxygen injection rates, and oxygen utilization. As seen in the figure, dissolved oxygen concentrations remained relatively elevated until April, 1998 (approximately 450 days of operation). It appeared that the well bore had become blocked and well recharge with oxygenated water was slow. After pumping the well, the dissolved oxygen levels increased to expected levels, indicating that the dissolved oxygen was elevated within the surrounding treatment area.

Dissolved oxygen concentrations were observed to decrease sharply following pumping at well WT-14A on April 27, 1998. Based on the rapid depletion of oxygen within the well observed over the following 24 hours, it appeared that biological activity is occurring and that the oxygen utilization rate was significant. Elevated dissolved CO_2 levels detected within the ground water also strongly suggest that bioactivity was indeed occurring. However, insufficient data were available to estimate the biodegradation rate within the treatment zone.

9.6.2.2 Ground-Water Elevation Trends Versus Constituent

The changes in the total SVOCs and benzene concentrations are compared to the ground-water elevation trends in Appendix N. As shown in the well WT-14A graphs in Appendix N, the total ground-water concentrations appear to increase as the ground-water elevations increased to approximately 570 to 572 feet mean sea level (MSL). When seasonal water table elevations decrease below approximately 568 feet MSL, ground-water concentrations appear to decline.

Well WT-14A is screened across a fill layer containing sand, silt, and clay from approximately 567 to 575 feet MSL and silt/clay layer from approximately 557 to 567 feet MSL. When the ground-water table elevations rise into the fill layer, total SVOCs and benzene concentrations tend to increase. This may indicate that the source of ground-water contamination is confined to the fill layer, and as a result, ground-water quality is only impacted during periods of high water table elevations.

9.6.2.3 Preliminary Conclusions

Based on results to date, biological activity has occurred within the treatment area although a residual source of ground-water impact may be confined in the fill layer. Fluctuations in ground-water quality occur primarily during periods of higher water table elevations, presumably when water is in contact with the impacted soils in the fill layer. According to the trend graph in Appendix N, overall ground-water concentrations have declined, except for seasonal fluctuations. Continued monitoring will help to confirm these preliminary observations.

No constituents of concern currently exceed permit-specified limits as of December 4, 1998. Some constituents of concern historically have fluctuated above and below the permit-specified limits including 2,4,6-trimethylphenol, m & p-cresols, and 2, 4, 6 - trichlorophenol. As was observed in 1997, concentrations again declined over the September and December 1998 quarters (due to ground-water fluctuations and continued biodegradation).

9.7 Recommendations

Currently, no constituents of concern are in exceedance of the permit-specified limits. Ground-water monitoring results from the second 1998 quarter indicated a slight increasing trend in ground-water concentrations, however, recent data from the third and fourth quarter 1998 have shown continued decreasing concentrations. As such, since concentrations of contaminants local to WT-14A have leveled off (no significant increases or decreases are noted and are currently non-detect), it is proposed that the injection of oxygen be discontinued to evaluate any rebound effects which may be associated with elimination of biosparging in this area. If it is determined that continued biosparging in the WT-14A area is not providing a net positive long term affect, then a decision to discontinue active treatment permanently will be made. The discontinuation of active biosparging will be made if it is determined that active biosparging is not resulting in a statistically significant decrease in overall concentrations in the area beyond what has already occurred. As the site-specific risk assessment has demonstrated no risk to receptors based on the low levels present, than future corrective measures other than long-term monitoring will not be proposed as part of final corrective measures.

10.0 BASIN A3 AND SURGE BASIN STABILIZATION

10.1 Objective

The objective of Basin A3/Digester and Surge Basin stabilization was to minimize the infiltration of storm water through any residual chemical constituents which may be present in soils or sediments underlying the basins. As noted below and in Sections 2.3.2.4 and 2.3.2.5, Basin A3/Digester and the Surge Basin had previously been clean closed under RCRA Interim Status, and subsequently used only for non-hazardous wastewater service. As such, the primary remaining objective was to physically stabilize non-hazardous sediments and backfill and regrade the basin area.

10.2 Description of Previous Stabilization Activities

RCRA closure activities for the limestone bed and equalization, surge, and emergency basins at the site were completed in 1986 and 1987. At that time, the facility had interim status under RCRA, and both the Part A and Part B permit applications included the referenced basins. As described in the RFI/SCMP Addendum (August 7, 1995), wastes managed in the basins were characteristically hazardous solely due to the characteristic of corrosivity. Therefore, as described in the RFI/SCMP Addendum, clean closure was achieved through pH adjustment of residues within the basins until post-closure testing demonstrated that the residues no longer exhibited the characteristic of corrosivity. Portions of the basin system were backfilled at that time, while others were subsequently used for non-hazardous wastewater service.

10.3 Description of Recent Stabilization Measures

Recent stabilization measures conducted during 1996 and 1997 involved the physical stabilization of residues and soils contained within the basins and backfilling/regrading of the former basin areas. These stabilization measures comprise the final soil stabilization measures for these units, and ground-water monitoring of these closed basins is included in the site-wide ground-water monitoring network.

10.4 Field Implementation of Closure

Field closure activities were conducted by Sevenson Environmental Services, Inc. (Sevenson). Terradon Corporation and, later, Potesta & Associates provided field oversight and QA/QC services. Field closure activities consisted of the following tasks:

- stabilization design mix testing;
- in-situ stabilization;
- post-stabilization compressive strength testing;
- regrading of stabilized material;
- placement of soil backfill and soil cover;
- excavation of a stormwater drainage channel to the Kanawha River (Basin A3); and
- revegetation of the former basin areas and soil borrow area.

10.4.1 Basin A3/Digester Stabilization

Prior to mobilization to begin stabilization of the on-site basins, Potesta & Associates obtained all necessary Federal and State permits for performing stabilization activities including National Pollutant Discharge Elimination System (NPDES) construction permits and United State Army Corp of Engineers (USACOE) permits for the Basin A3 drainage swale, in addition to WVDEP air permits for particulate generation during stabilization efforts.

10.4.1.1 Mobilization

Sevenson mobilized to the FLEXSYS Plant the first week of September 1996. Sevenson mobilized the following heavy equipment to the site: one Caterpillar D25C Dump Truck, one Moxy 6200X Dump Truck, one Caterpillar D68E Bulldozer, one Volvo BM L-150 Rubber-Tired Loader, one Ingersoll Rand Spf-56 Compactor, one Komatsu Pc-220-L3 Backhoe, and two Komatsu Pc-220-LC3 Backhoes. FLEXSYS provided a portable building to serve as a guard house and supplied a guard for the WTP gate to be used by Sevenson employees and for construction deliveries.

10.4.1.2 Stabilization Efforts

Construction commenced on September 4, 1996 consisting of improving roadways, draining impounded water from the Basin A3, stockpiling soil in the borrow area and constructing earthen berms for reagent storage. The reagent bins were large enough that tractor trailer pneumatic tanker trucks could back into them to discharge their load. Each bin could hold approximately ten tanker loads of reagent. The bins were covered by plastic sheeting to control dust during unloading and to protect the reagent from precipitation.

Samples from the Basin A3 were obtained and analyzed for VOCs and SVOCs in support of preparing a final mix design for the stabilization. Sample results of the sludge were essentially non-detect for all compounds analyzed with less than 1 mg/kg of total VOCs/SVOCs present in the sludge. On September 11, 1996, Sevenson began stabilization of sludge in the northwest corner of the Basin A3. Two backhoes were used to stabilize sludge while the third loaded soil into trucks in the borrow area. The backhoe operator would create a mixing pit by building a semi-circular soil dike in front of this backhoe and then mix two parts sludge to two parts soil to one part lime kiln dust (LKD) in the pit. The operation would then advance by the backhoe occupying a location on top of the previously stabilized material to mix another batch.

An alternate method involved placing the stabilized material behind the backhoe and completing sludge stabilization by bailing sludge into the mixing pit. The sludge would periodically build up in "waves" in front of the mixing pits. When those occurred, the same pits would be used to mix numerous batches of sludge until the "wave" receded. As stabilization moved along the northern bank of the Basin A3, LKD and soil were stockpiled on previously stabilized material. Doing so reduced the tram distance of the loader, which supplied both soil and LKD to the mixing pits.

On October 15, 1996, representatives from the Office of Air Quality, West Virginia Division of Environmental Protection visited the site in accordance with the air permit obtained for site activities. A work plan was created to reduce the dust by watering the roads, minimizing loader speed and tram distance of LKD, reducing off-loading pressure of LKD from trucks, and reducing drop height of LKD by backhoes during mixing. On November 1, 1996, pipe, steel and concrete construction and demolition material (C&D material) was discovered in the northwest corner of the soil borrow area, and the limits of the soil borrow area were adjusted to the northwest.

On November 6, 1996, one load of Magnalime was received in a trailer dump truck on a trial basis. The truck was unloaded in an LKD bin and created very little dust due to its larger particle size and higher lime content than the LKD. Unloading was also faster. It was decided to use as much magnalime as was available to augment the LKD. To increase productivity, a number of measures were implemented. A third backhoe was put in the basin to stabilize sludge. When needed, it would move back into the soil borrow area to load soil. Light plants were employed the first week of December around the basin to allow for longer work days and an LKD bin was built in the basin to reduce tram distance. Upon completion of stabilization efforts, permeabilities of the stabilized matrix were designed to be in the 10^{-6} to 10^{-7} cm/sec range, thus, prohibiting infiltration through the stabilized matrix.

Digester

In early December, the inactive digester bottom was sounded, sludge volume was calculated and samples were taken. The analytical results were similar to those from the Basin A3, and the digester closure was put out to bid. Bid documents were the same technical specifications used for A3 and drawings showing the anticipated sludge configuration. Sevenson was awarded the contract. The soil needed for stabilization and backfill came from a drainage channel excavation through the soil borrow area that would drain the completed and covered Basin A3 area to the Kanawha River. The stabilized material was placed in the western half of the Basin A3 and graded to allow surface-water drainage. The inactive digester was backfilled with compacted soil from the borrow area.

In early January 1997, excavation of the drainage ditch from the Basin A3 to the Kanawha River was started in accordance with previously obtained permits. The ditch was 100 feet wide at the river and became narrower towards the basin depending on how much soil was needed for the digester. Soil was also needed to cover the rubble area in the soil borrow area and for cover in the Basin A3. On January 20, 1997, Sevenson began placing soil cover in the Basin A3 to a minimum thickness of 12 inches. On January 24, 1997, the Basin A3 and digester stabilization was completed.

On April 30, 1997 and May 1, 1997, the site was limed, fertilized, disked and hydroseeded. The site was wet and some ruts were created by the hydroseed trucks. Upon completion of hydroseeding, caution flagging was put up to keep vehicles out of the area. The plant roads adjacent to the site were swept and potholes were packed with gravel. The last job trailer was picked up and an audit of Sevenson's performance was completed May 5, 1997 by Solutia.

10.4.2 Surge Basin Stabilization

Stabilization of the Surge Basin was completed in May 1998 by Enreco/Williams Environmental. The sludge stabilization was performed in a similar manner to that which had been successfully used for the Basin A3. One significant difference was the use of the Enreco injector fork mix technology. This method uses a backhoe bucket filled with injection tubes in order to directly blow in stabilization reagents beneath the sludge surface during mixing. This method helps reduce dust and ensures an even mix. The western berm of the former basin was used as the source of cover soil for the completed basin closure. Revegetation then proceed as previously described in the Basin A3 closure with similar stabilized permeabilities present in the stabilized matrix.

10.5 Closure Certification

RCRA clean closure certifications were submitted at the time of the 1986-87 basin closures, and copies of the certifications were provided as attachments to the RFI/SCMP Addendum. A copy of the as-built topographic plan of the basin backfilling/regrading corrective measures is provided as Plate 1.

10.6 Post-Closure Care

The only post-closure care required for the former basins is the maintenance of the vegetative cover. There are no mechanical/structural systems to maintain, and ground-water monitoring is conducted as part of the site-wide monitoring network.

REFERENCES

Brown, Richard et al., 1993. Lecture course notes - "Aeration Technologies for Soil and Ground Water Remediation," June 2-4, 1993, St. Louis, Missouri.

Corps of Engineers (COE), 1995; Telephone Conversation, September 1995.

de Pastrovich, T.L., Baradat, Y., Barthel, R., Chiarelli, A., Fussell, D.R. "Protection of Ground Water from Oil Pollution", CONCAWE Water Pollution Special Task Force No. 11, The Hague, Netherlands, April 1979.

Doll, W.L., Wilmoth, B.M., and Whetstone, G.W., 1960. Water Resources of Kanawha County, West Virginia. West Virginia Geological and Economic Survey.

Driscoll, Fletcher G., 1989. Groundwater and Wells, 1989.

Envirogen, 1996. Letter of Transmittal dated January 22, 1996.

Geraghty & Miller, Inc., 1985. Groundwater Assessment - Waste-Water Treatment Plant, May 1985.

Geraghty & Miller, Inc., 1985a. Ground-Water Quality Investigation at the Monsanto Plant, October 1985.

Gruszenski, Thomas, S&ME, Inc., 1987. "Determination of a Realistic Estimate of The Actual Formation Product Thickness Using Monitor Wells: A Field Bailout Test", in Proceedings of the NWMA/API Conference on Petroleum Hydrocarbons and Organic Chemicals in groundwater – Prevention, Detection and Restoration, November 17-19, 1997, Houston, Texas.

Price, Paul H., 1960. Water Resources in Kanawha County, West Virginia, West Virginia Geological and Economic Survey, Bulletin 20.

Roux Associates, Inc., 1993. Revised Final Verification Investigation Report, August 24, 1993.

Roux Associates, Inc., 1994. Facility Sewer System Stabilization Work Plan Evaluation Study, August 5, 1994.

Roux Associates, Inc., 1995. RFI Report and Stabilization/Corrective Measures Plan, May 5, 1995.

Roux Associates, Inc., 1995a. Sewer Stabilization Measures Evaluation Report, May 30, 1995.

Roux Associates, Inc., 1995b. Addendum to the RFI Report and Stabilization/Corrective Measures Plan, August 7, 1995.

Roux Associates, Inc., 1995c. Request for Bid Installation of Kerosene Recovery/Treatment System, October 27, 1995.

State of West Virginia, Department of Health and Human Resources, West Virginia Public Water System Inventory, March 1995.

State of West Virginia, Title 46, 1995. Legislative Rules, Division of Environmental Protection, Environmental Quality Board, Series 1, Requirements Governing Water Quality Standards. Effective August 18, 1995.

State of West Virginia, Title 47, Legislative Rules, Division of Environmental Protection, Department of Commerce Labor and Environmental Resources, Series 58, Groundwater Protection Regulations.

Testa, Stephen M. and Paczkowski, Michael, 1989. "Volume Determination and Recoverability of Free Hydrocarbon", GWMR, Winter 1989, pp 120-128.

USEPA, 1985. Technical Support Document for Water Quality-Based Toxics Control, EPA-440/485-032, September 1985.

USEPA, 1987. Alternative Concentration Limit Guidance, Part I, ACL Policy and Information Requirements, Interim Final, EPA/530-SW-87-017, July 1987.

USEPA, 1988. Alternate Concentration Limit Guidance, EPA/530-SW-87-031, May 1988.

USEPA, 1989. Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Final Guidance, EPA/530-SW-89-026, April, 1989.

USEPA, 1991. Technical Support Document for Water Quality-Based Toxics Control, EPA/505/2-90-001, March 1991.

USEPA,1992a. General Methods for Remedial Operations Performance Evaluations, EPA/600/R-92/002, January 1992.

USEPA, 1993. Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration, EPA/540-R-93-080, September 1993.

USEPA, 1995. Risk-Based Concentration Table, July-December 1995. U.S. Environmental Protection Agency, Region III, Office of RCRA Technical & Program Support Branch, October 20, 1995.

USEPA, 1996. How to Effectively Recover Free product at Leaking Underground Storage Tank Sites: A Guide For State Regulators, September 1996.

USEPA, 1997. Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites, Directive 9200.4-17, November 1997.

West Virginia Geological and Economic Survey, Water-Use Database of the Kanawha River, October 1995.

Wilmoth, B.M., 1966. Ground Water in Mason and Putnam Counties, West Virginia. West Virginia Geological and Economic Survey, Bulletin 32.

TABLES

Table 1. Site Monitoring and Extraction Well Summary Table. Solutia, Inc., Nitro, West Virginia.

Well Designation	Installation Date	Location	Total Depth (ft)	Screen Setting (ft)	Diameter (inches) Casing	State Plane Coordinates (ft) Northing	State Plane Coordinates (ft) Easting	Top-of-Casing Elevation (ft.)	Ground Surface Elevation (ft.)	Depth to Water (ft.) on 9/20/94	Ground-Water Elevation (ft.) on 9/20/94
Waste Treatment Area											
TB-1	9/14/81	2,4,5-T Building	32	27-32	2"	527,385.70	1,760,123.61	593.07	591.4	25.21	567.86
TB-3	9/16/81	2,4,5-T Building	32	27-32	2"	527,424.48	1,760,030.87	592.9	591.8	26.18	566.72
TD-1	NA	2,4,5-T Building	32	27-32	2"	527,471.32	1,760,182.10	592.2	590.4	24.72	567.48
TD-3	NA	2,4,5-T Building	30	27-30	2"	527,518.22	1,760,073.84	590.92	589.5	24.4	566.52
TD-5	NA	2,4,5-T Building	30	25-30	2"	527,538.36	1,759,999.72	589.49	588.4	22.98	566.51
WT-1(1)	2/4/92	Emergency Basin	33.5	13.5-33.5	4"	526,771.35	1,760,979.93	590.33	588.6	18.55	571.78
WT-2	9/1/81	Emergency Basin	53.5	16.5-53.3	4"	526,294.56	1,760,733.01	590.13	588.4	17.57	572.56
WT-3	9/14/81	Surge Basin	55	15-55	4"	527,002.78	1,760,299.42	590.67	589.6	18.76	571.91
WT-4A	9/14/81	Limestone Bed	40	25-40	4"	527,385.69	1,760,258.72	591.82	590.4	21.81	570.01
WT-4B	9/4/81	Limestone Bed	58	41-58	4"	527,377.73	1,760,255.20	592.06	590.5	23.86	568.2
WT-5A	9/12/81	Digester	43	28-43	4"	572,732.59	1,760,459.29	589.99	588.8	23.33	566.66
WT-5B	9/12/81	Digester	58	43-58	4"	527,724.96	1,760,450.85	589.93	588.7	22.94	566.99
WT-6	9/3/81	Digester	53	18-53	4"	527,586.80	1,760,709.73	589.09	587.5	18.18	570.91
WT-7A	11/28/85	Activated Sludge Basin	41.5	21.5-41.5	2"	527,588.94	1,760,101.49	589.25	587.5	22.72	566.53
WT-7B	11/28/85	Activated Sludge Basin	56.6	41.5-56.5	2"	527,602.11	1,760,121.61	589.16	587.4	22.81	566.35
WT-7C	11/28/85	Activated Sludge Basin	73	62-72	2"	527,599.91	1,760,119.55	589.12	587.3	22.68	566.44
WT-8A	12/4/85	Polishing Basin	39	19-39	2"	527,736.75	1,761,254.41	589.42	587.6	19.25	570.17
WT-8B	12/4/85	Polishing Basin	52	37-52	2"	527,732.57	1,761,255.87	589.31	587.4	19.08	570.23
WT-8C	12/4/85	Polishing Basin	70	60-70	2"	527,728.43	1,761,258.20	587.13	586.6	16.62	570.51
WT-9A(1)	2/5/92	Emergency Basin	50	30-50	4"	526,938.14	1,760,750.51	599.71	598	27.98	571.73
WT-9B(1)	2/5/92	Emergency Basin	68.5	48.5-68.5	4"	526,941.59	1,760,744.01	598.61	596.6	28.36	570.25
WT-9C(1)	2/6/92	Emergency Basin	80	72-80	4"	526,944.93	1,760,736.58	599.53	598	27.88	571.65
WT-10A	1/15/85	Upgradient	39	19-39	2"	526,337.47	1,760,619.82	590.13	588.4	17.64	572.49
WT-10B	1/15/85	Upgradient	54	39-54	2"	526,339.45	1,760,615.98	590.09	588.4	17.6	572.49
WT-10C	1/15/85	Upgradient	70	60-70	2"	526,341.58	1,760,611.89	590.3	588.6	17.76	572.54
WT-11A	1/23/85	Off-Site	42	22-42	2"	526,964.40	1,761,221.25	588.6	588.9	17.11	571.49
WT-11B	1/23/85	Off-Site	54	39-54	2"	526,966.51	1,761,215.92	588.47	588.8	17.21	571.26
WT-11C	1/23/85	Off-Site	74	64-74	2"	526,969.03	1,761,211.45	588.27	588.6	16.98	571.29
WT-13A	8/28/94	City of Nitro Dump	34	14-34	4"	527,212.70	1,759,435.46	590.82	589.1	24.51	566.31
WT-14A	8/27/94	City of Nitro Dump	40	15-35	4"	527,368.89	1,759,863.07	593.57	591.9	26.06	567.51
WT-15A	8/27/94	City of Nitro Dump	24	9-24	4"	526,862.43	1,759,788.61	589.08	587.4	9.65	579.43
Process Area											
MW-1A	9/8/83	Upgradient	32	20-30	2"	523,682.79	1,758,656.75	594.37	592.5	18.97	575.4
MW-1B	1/2/85	Upgradient	55	40-55	2"	523,677.68	1,758,654.66	594.38	592.5	19.07	575.31
MW-2A	9/9/83	FMC Boundary	32	20-30	2"	523,985.28	1,757,719.85	592.6	591.2	19	573.6
MW-2B	1/14/85	FMC Boundary	55	40-55	2"	523,983.89	1,757,724.14	592.84	591.1	19.41	573.43
MW-3A	9/9/83	Riverfront	35	25-35	2"	524,399.80	1,757,078.36	598.85	597.2	28.5	570.35
MW-3B	12/20/84	Riverfront	61	46-61	2"	524,405.89	1,757,080.05	599.24	597.2	28.59	570.65
MW-4A	9/12/83	Riverfront	38	27.5-37.5	2"	524,730.40	1,757,237.59	598.56	596.4	27.33	571.23
MW-4B	NA	Riverfront	61.5	41.5-61.5	4"	524,725.90	1,757,235.40	598.05	596.3	26.76	571.29
MW-5A	8/31/83	Riverfront	33	23-33	2"	525,290.85	1,757,548.36	594.65	593.3	25.58	569.07
MW-5B	NA	Riverfront	56	41-56	2"	525,293.92	1,757,544.43	594.91	593	25.76	569.15
MW-6A	9/1/83	Past Disposal Area	30	20-30	2"	525,706.25	1,757,858.98	591.39	590	24.65	566.74
MW-6B	12/17/84	Past Disposal Area	58	43-58	2"	525,709.00	1,757,853.23	592.76	591	23.33	569.43

Table 1. Site Monitoring and Extraction Well Summary Table. Solutia, Inc., Nitro, West Virginia.

Well Designation	Installation Date	Location	Total Depth (ft)	Screen Setting (ft)	Diameter (inches) Casing	State Plane Coordinates (ft) Northing	Easting	Top-of-Casing Elevation (ft.)	Ground Surface Elevation (ft.)	Depth to Water (ft.) on 9/20/94	Ground-Water Elevation (ft.) on 9/20/94
MW-7	10/1/83	Past Disposal Area	30	20-30	2"	526,267.61	1,758,312.17	594.03	592.5	26.89	567.14
MW-8	9/1/83	Past Disposal Area	30	20-30	2"	525,618.70	1,758,192.64	588.3	586.7	19.85	568.45
MW-10	9/7/83	Process Area	29.5	17-27	2"	524,351.11	1,758,124.90	590.2	588.3	16.43	573.77
MW-11A	9/6/83	Upgradient	31	19-29	2"	524,491.39	1,758,970.37	591.13	589.4	16.67	574.46
MW-11B	9/6/83	Upgradient	NA	38-48	2"	524,488.69	1,758,968.99	591.01	589.6	16.56	574.45
MW-12	9/7/83	Process Area	29.5	18-28	2"	524,562.91	1,758,459.94	589.8	588.4	15.6	574.2
MW-13	9/13/83	Process Area	29	18-28	2"	523,940.91	1,758,479.24	590.84	589.2	15.3	575.54
MW-14	9/2/83	Process Area	29	18-28	2"	525,369.74	1,758,627.78	589.53	588	15.93	573.6
MW-15	9/2/83	Process Area	NA	10-20	2"	525,001.40	1,759,181.38	588.09	586.3	13.92	574.17
MW-17A	1/31/85	FMC Boundary	40	30-40	2"	523,820.34	1,758,152.95	591.53	589.9	17.4	574.13
MW-17B	2/4/85	FMC Boundary	56	36-56	4"	523,822.81	1,758,146.49	591.85	590.4	17.66	574.19
MW-18A	2/5/85	FMC Boundary	40	30-40	2"	524,080.27	1,757,438.28	593.2	591.3	21.03	572.17
MW-18B	2/5/85	FMC Boundary	55	40-55	2"	524,083.03	1,757,433.50	592.59	590.7	20.33	572.26
MW-19A	1/2/85	Process Area	40	30-40	2"	524,570.10	1,757,130.91	597.58	595.7	28.88	568.7
MW-19B	1/2/85	Process Area	62	47-62	2"	524,575.05	1,757,132.68	598.17	597	27.17	571
MW-20A	1/29/85	Riverfront	40	30-40	2"	525,073.89	1,757,371.43	596.71	594.9	27.38	569.33
MW-20B	1/29/85	Riverfront	57	42-57	2"	525,087.71	1,757,347.47	596.76	594.8	27.22	569.54
MW-21A	1/10/85	Riverfront	40	30-40	2"	525,486.77	1,757,666.51	592.65	591.7	25.05	567.6
MW-21B	1/11/85	Riverfront	58	43-58	2"	525,490.68	1,757,669.51	594.07	592.4	25.43	568.64
MW-22R	8/26/94	Past Disposal Area	40	18-38	4"	525,893.64	1,757,941.10	596.53	594	28.99	567.54
MW-23A	8/24/94	FMC Boundary	35	19.8-34.8	4"	524,252.90	1,757,009.16	598.82	597.3	28.28	570.54
MW-24A	8/25/94	Niran Residue Pit	35	15-35	4"	525,618.99	1,757,812.17	594.58	592.1	26.12	568.46
EW-1	12/7/95	LNAPL Area	57	16.8-56.8	6"	526,322.18	1,758,336.40	593.79	592.69	NA	NA
EW-2	12/4/95	LNAPL Area	57.5	12-57.3	6"	526,275.04	1,758,310.64	593.6	592.38	NA	NA
EW-3	11/27/95	LNAPL Area	59	16.9-56.6	6"	526,246.24	1,758,269.98	593.7	592.9	NA	NA
EW-4	12/4/95	LNAPL Area	57.5	17-56.5	6"	526,214.59	1,758,303.85	592.9	592.3	NA	NA
EW-5A	9/19/96	TCE Hot Spot	41.95	26.95-41.95	6"	525,611.35	1,757,754.04	NA	NA	NA	NA
EW-5B	NA	TCE Hot Spot	56.87	41.87-56.87	6"	525,602.20	1,757,751.73	NA	NA	NA	NA
EW-6A	9/9/96	TCE Hot Spot	40.76	25.76-40.76	6"	525,286.86	1,757,556.32	NA	NA	NA	NA
EW-6B	9/11/96	TCE Hot Spot	58.4	43.40-58.40	6"	525,276.78	1,757,551.57	NA	NA	NA	NA
EW-7A	NA	TCE Hot Spot	40.1	25.10-40.10	6"	525,150.42	1,757,427.00	NA	NA	NA	NA
EW-7B	9/3/96	TCE Hot Spot	57.38	42.38-57.38	6"	525,145.89	1,757,431.40	NA	NA	NA	NA
EW-8	8/29/96	TCE Hot Spot	40.4	25.40-40.40	6"	524,260.11	1,757,012.11	NA	NA	NA	NA
W-1	NA	LNAPL Area	42.67	NA	8"	526,291.52	1,758,300.27	594.96	NA	NA	NA
R-1	NA	LNAPL Area	49.93	NA	4"	526,252.91	1,758,306.40	592.94	NA	NA	NA
R-2	NA	LNAPL Area	NA	NA	4"	526,250.00	1,758,305.26	592.92	NA	NA	NA
B-1	NA	LNAPL Area	35.38	NA	2"	526,335.91	1,758,341.17	594.98	NA	NA	NA
B-2	NA	LNAPL Area	32.15	NA	2"	526,210.18	1,758,317.14	592.87	NA	NA	NA
B-3	NA	LNAPL Area	33.19	NA	2"	526,241.85	1,758,257.24	595.14	NA	NA	NA
B-4	NA	LNAPL Area	32	NA	2"	526,275.05	1,758,327.29	593.82	NA	NA	NA
B-5	NA	LNAPL Area	14.45	NA	2"	526,334.45	1,758,214.71	578.92	NA	NA	NA
B-6	NA	LNAPL Area	11.89	NA	2"	526,374.51	1,758,247.02	575.66	NA	NA	NA
B-7	NA	LNAPL Area	14.42	NA	2"	526,421.95	1,758,285.49	577.37	NA	NA	NA
B-8A	11/28/95	LNAPL Area	42.67	26.3-41.3	4"	526,546.10	1,758,537.77	595.64	NA	NA	NA
B-8B	12/13/95	LNAPL Area	59.5	40.0-60.0	4"	526,538.08	1,758,530.89	595.69	NA	NA	NA
B-9	11/28/95	LNAPL Area	33.07	36.2-42.1	4"	526,791.66	1,758,797.53	594.23	NA	NA	NA

Table 2. Predicted Surface-Water Concentration of Select Constituents for TCE Hot Spot and Past Disposal Areas. Solutia, Inc., Nitro, West Virginia.

Identified Chemicals of Potential Concern	TCE Hot Spot	Past Disposal Area	AWQC or WV Water Quality[1]
VOCs			
Chlorinated Ethenes & Ethanes			
1,1-Dichloroethene	2.18E-03	3.87E-04	1.9
Tetrachloroethene	2.57E-03	3.88E-04	8.9
Trichloroethene	2.03E-01	5.06E-02	92
1,1-Dichloroethane	4.27E-03	3.87E-04	NS
Aromatics			
Benzene	1.89E-03	7.34E-03	40
Chlorinated Methanes			
Carbon Tetrachloride	5.90E-03	1.27E-03	4.4
Miscellaneous			
1,2-Dichloropropane	1.40E-03	1.39E-03	NS
BN/AE			
Phthalates			
Bis (2-ethylhexyl) phthalate	2.73E-03	1.84E-03	3
Metals			
Cadmium	6.04E-06	4.59E-06	0.0011
Chromium	6.55E-06	1.54E-06	0.01
Copper	6.95E-06	1.31E-06	0.0055
Lead	6.43E-06	3.42E-07	0.001

Concentrations in micrograms per liter (μg/ℓ) for VOCs and the SVOCs, in milligrams per liter (mg/ℓ) for metals.

NS = Limit not specified.

Refer to Appendix C for calculations.

[1]Water quality criteria based on more stringent of the Class B use as specified in the West Virginia Water Quality Standards, amended July 1, 1994, and Ambient Water Quality Standards, as developed in the risk evaluation.

Table 3. Predicted Surface-Water Concentrations for VOC, BN/AE, and Metal Analytes for Nitro Dump and Northern Waste Treatment Area. Solutia, Inc., Nitro, West Virginia.

Identified Chemicals of Potential Concern	Nitro Dump	Northern Waste Treatment Area	AWQC or WV Water Quality[1]
VOCs			
Aromatics			
Benzene	3.10E-04	1.41E-03	40
Chlorinated Methanes			
Chloromethane	1.48E-04	1.83E-04	16
Chlorinated Benzenes			
Chlorobenzene	4.68E-05	1.86E-03	50
Miscellaneous			
1,2-Dichloropropane	4.46E-05	9.81E-05	NS
BN/AE			
Phenols			
4-Chloro-3-methylphenol	2.10E-04	1.83E-04	NS
2-Methylphenol	3.43E-04	1.83E-04	NS
3- and 4-Methylphenol	5.21E-03	2.26E-04	2,560
NitroPhenols			
4-Nitrophenol	4.36E-04	9.27E-04	NS
2-Nitrophenol	8.71E-05	2.10E-04	NS
4,6-Dinitro-2-methylphenol	4.36E-04	9.14E-04	NS
Metals			
Cadmium	8.71E-08	2.05E-07	0.0011
Chromium	1.81E-07	2.35E-06	0.01
Copper	1.96E-05	3.14E-06	0.0065
Lead	5.30E-08	3.55E-06	0.001
Mercury	2.50E-09	3.65E-09	0.000012

Concentrations in micrograms per liter (µg/ℓ) for VOCs and the SVOCs, in milligrams per liter (mg/ℓ) for metals.

Refer to Appendix C for calculations.

NS = Limit not specified.

[1] Water quality criteria based on more stringent of the Class B use as specified in the West Virginia Water Quality Standards, amended July 1, 1994 and Ambient Water Quality Standards, as developed in the risk evaluation.

Table 4. Summary of Estimated Ecological Hazard Quotients (HQ_Es) for Site-Related Concentrations of Chemicals. Solutia, Inc., Nitro, West Virginia.

Chemical	Estimated Chemical Concentration in River (µg/L) Using Site Ground-Water Concentration in: Process Area (PA) (a)	Waste Treatment Area (WT) (b)	Applicable Water Quality Standard (µg/L) "Ecological RfD" (WQS) (c)		Ecological HQ (HQ_E) for Aquatic Organisms in River Using Estimations in Ground Water from: Process Area (PA) (d)	Waste Treatment Area (WT) (d)
Volatile Organic Compounds						
Benzene	7.3E-3	1.4E-3	4.0E+1	*[1]*	1.8E-4	3.5E-5
Carbon Tetrachloride	6.4E-3	---	4.4E+0	*[1]*	1.5E-3	---
Chlorobenzene	---	2.0E-3	5.0E+1	*[1]*	---	4.0E-5
Chloromethane	---	1.8E-4	1.6E+1	*[1]*	---	1.2E-5
1,1-Dichloroethane	4.9E-3	---	1.5E+3	*[2]*	3.3E-6	---
1,1-Dichloroethene	3.0E-3	---	1.9E+0	*[1]*	1.6E-3	---
1,2-Dichloropropane	2.4E-3	9.8E-5	2.1E+4	*[3]*	1.1E-7	4.7E-9
Tetrachloroethene	3.3E-3	---	8.9E+0	*[1]*	3.7E-4	---
Trichloroethene	2.0E-1	---	9.2E+1	*[1]*	2.1E-3	---
BN/AE Compounds						
Bis(2-ethylhexyl)phthalate	2.7E-3	---	3.0E+0	*[1]*	9.1E-4	---
2-Methylphenol	---	3.4E-4	4.9E+1	*[2]*	---	7.0E-6
3-Methylphenol	---	5.2E-3	4.9E+1	*[2]*	---	1.1E-4
4-Methylphenol	---	5.2E-3	1.4E+3	*[3]*	---	3.7E-6
2-Nitrophenol	---	2.2E-4	7.3E+3	*[3]*	---	3.1E-8
4-Nitrophenol	---	9.3E-4	4.8E+1	*[2]*	---	1.9E-5
4-Chloro-3-methylphenol	---	2.1E-4	3.7E+2	*[3]*	---	5.7E-7
4,6-Dinitro-2-Methylphenol	---	9.1E-4	6.1E+1	*[3]*	---	1.5E-5
Metals						
Cadmium	6.0E-3	2.1E-4	1.1E+0	*[1]*	5.5E-3	1.9E-4
Chromium	6.6E-3	2.4E-3	1.0E+1	*[1]*	6.6E-4	2.4E-4
Copper	6.4E-3	2.0E-2	6.5E+0	*[1]*	9.9E-4	3.0E-3
Lead	6.6E-3	3.6E-3	1.0E+0	*[1]*	6.6E-3	3.6E-3
Mercury	---	3.7E-6	1.2E-3	*[1]*	---	3.0E-3
			Hazard Index (HI) is Σ HQs =		2.0E-2	1.0E-2

Notes:

--- Indicates compound was not a chemical of potential concern in given area.

(a) Concentrations estimated from model for TCE Hot Spot Area (PA)

(b) Concentrations estimated from model for Northern Waste Treatment Area (WT).

(c) Water Quality Standards (WQS). [1]: Concentration is the lesser concentration of either Ambient Water Quality Criteria (AWQC) for freshwater organisms or WV Water Quality Standards.
[2]: Estimated lowest chronic value for fish from Suter and Mabrey (1994) in conjunction with safety factor of 10. 2-Methylphenol used as surrogate for 3-methylphenol.
[3]: Value obtained from 96 hour LC_{50} in ACQUIRE database (Tables 27 through 31) in conjunction with safety factor of 10.

(d) Ecological hazard quotient (HQ_E) equals concentration divided by "ecological" RfD which is water quality standard. HQ_E = PA / WQS or HQ_E = WT / WQS.

Table 5. Summary of all Incremental Lifetime Cancer Risks (ILCRs) for the Carcinogenic Constituents of Potential Concern. Solutia, Inc., Nitro, West Virginia.

	Exposure to Surface Water				Ingestion of Fish			
	Adjacent to Process Area		Adjacent to Waste Treatment Area		Adjacent to Process Area		Adjacent to Waste Treatment Area	
Chemical	Adults (a)	Children (b)	Adults (c)	Children (d)	Adults (e)	Children (f)	Adults (g)	Children (h)
Volatile Organic Compounds								
Benzene	2.1E-10	3.8E-10	4.1E-11	7.4E-11	2.4E-12	2.8E-13	4.7E-13	5.4E-14
Carbon Tetrachloride	2.0E-10	3.9E-10	---	---	6.7E-11	7.7E-12	---	---
Chloromethane	---	---	1.6E-13	3.7E-13	---	---	1.8E-14	2.1E-15
1,1-Dichloroethene	3.3E-10	6.4E-10	---	---	1.2E-10	1.4E-11	---	---
1,2-Dichloropropane	2.0E-11	4.1E-11	8.3E-13	1.7E-12	4.3E-12	4.9E-13	1.8E-13	2.0E-14
Tetrachloroethene	6.8E-10	1.2E-9	---	---	2.2E-11	2.6E-12	---	---
Trichloroethene	4.3E-9	7.7E-9	---	---	9.8E-11	1.1E-11	---	---
BN/AE Compounds								
Bis(2-ethylhexyl)phthalate	1.3E-11	2.5E-11	---	---	1.2E-11	1.3E-12	---	---

All ILCRs for all scenarios are at least three orders of magnitude below *de minimis* risks of 1E-6

Notes:

--- Indicates that chemical was not a chemical of potential concern in given area.

(a) From Table 19
(b) From Table 20
(c) From Table 21
(d) From Table 22
(e) From Table 22
(f) From Table 23
(g) From Table 24
(h) From Table 25

Table 6. Summary of All Hazard Quotients (HQs) for the Noncarcinogenic Constituents of Potential Concern. Solutia, Inc., Nitro, West Virginia.

Chemical	Exposure to Surface Water				Ingestion of Fish			
	Adjacent to Process Area		Adjacent to Waste Treatment Area		Adjacent to Process Area		Adjacent to Waste Treatment Area	
	Adults (a)	Children (b)	Adults (c)	Children (d)	Adults (e)	Children (f)	Adults (g)	Children (h)
Volatile Organic Compounds								
Carbon Tetrachloride	1.2E-4	3.9E-4	---	---	1.7E-6	5.9E-7	---	---
Chlorobenzene	---	---	2.3E-6	7.3E-6	---	---	3.9E-8	1.4E-8
1,1-Dichloroethane	3.0E-7	1.1E-6	---	---	4.1E-9	1.4E-9	---	---
1,1-Dichloroethene	3.3E-6	1.1E-5	---	---	5.1E-8	1.8E-8	---	---
Tetrachloroethene	6.9E-5	2.1E-4	---	---	1.0E-7	3.5E-8	---	---
Trichloroethene	3.5E-3	1.1E-2	---	---	3.5E-6	1.2E-6	---	---
BN/AE Compounds								
Bis(2-ethylhexyl)phthalate	2.5E-6	8.1E-6	---	---	9.6E-8	3.3E-8	---	---
2-Methylphenol	---	---	8.1E-8	2.7E-7	---	---	7.6E-10	2.7E-10
3-Methylphenol	---	---	1.2E-6	4.1E-6	---	---	1.3E-8	4.5E-9
4-Methylphenol	---	---	1.2E-5	4.1E-5	---	---	1.2E-7	4.0E-8
4-Nitrophenol	---	---	6.8E-8	2.5E-7	---	---	7.3E-9	2.5E-9
Metals								
Cadmium	2.4E-5	1.1E-4	8.0E-7	3.7E-6	5.2E-8	1.8E-8	1.7E-9	6.1E-10
Chromium	1.3E-8	5.9E-8	4.6E-9	2.1E-8	2.4E-11	8.4E-12	8.7E-12	3.0E-12
Copper	3.4E-7	1.6E-6	1.0E-6	4.8E-6	NA	NA	NA	NA
Lead	6.8E-6	3.5E-5	3.6E-6	1.9E-5	2.2E-7	7.6E-8	1.2E-7	4.1E-8
Mercury	---	---	2.4E-8	1.1E-7	---	---	9.8E-6	3.4E-6
Hazard Index (HI) is å HQs =	3.7E-3	1.1E-2	2.2E-5	8.0E-5	5.7E-6	2.0E-6	1.0E-5	3.5E-6

All HQs are at least two orders of magnitude below target HQ of 1.0E+0.

All HIs are at least two orders of magnitude below target HQ of 1.0E+0.

Notes:

NA indicates not applicable since compound does not bioconcentrate.

--- Indicates that chemical was not a chemical of potential concern in given area.

(a) From Table 19 (e) From Table 23

(b) From Table 20 (f) From Table 24

(c) From Table 21 (g) From Table 25

(d) From Table 22 (h) From Table 26

Table 7. Summary of TCE and Benzene Analytical Results for TCE Hot Spot and Past Disposal Area Quarterly Performance Monitoring. Solutia, Inc., Nitro, West Virginia.

Trichloroethylene

Date	MDL	9/20/96	12/6/96	3/3/97	6/17/97	9/9/97	11/20/97	2/18/98	6/25/98	10/6/98	12/4/98
MW-1A	0.005	<0.005	0.06	0.008	<0.005	<0.005	0.006	<0.005	<0.005	<0.005	<0.005
MW-1B	0.005	0.033	0.023	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-5A	0.005	0.186	1.7	1.45	1.04	0.341	0.797	0.771	0.776	1.67	1.16
MW-5B	0.005	2.87	3.04	2.33	1.68	3.1	3.44	3.6	1.69	3.4	3.43
MW-20A	0.005	7.45	7.11	2.05	7.73	2.98	9.18	3.58	0.836	7.04	7.41
MW-20B	0.25	1.18	1.13	1.08	1.18	0.755	1.74	1.33	2.92	2.81	2.79
MW-22R	0.005	0.012	0.019	0.019	0.005	0.007	0.077	0.026	0.029	0.017	<0.005
MW-23A	0.005	1.47	1.45	1.29	2.52	1.65	2.09	1.49	2.63	1.19	1.67
MW-24A	0.05	0.568	0.657	0.543	0.431	0.593	1.29	2.06	0.102	0.167	0.2

Benzene

Date		9/20/96	12/6/96	3/3/97	6/17/97	9/9/97	11/20/97	2/18/98	6/25/98	10/6/98	12/4/98
MW-7	0.5	3.03	<0.5	4.19	4.33	2.1	5.34	1.58	3.03	2.77	2.99
MW-14	0.005	<0.005	0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW-22R	0.005	0.15	0.021	0.015	0.011	0.009	0.012	0.012	0.007	0.007	<0.005
MW-24A	0.05	0.894	1.08	1.03	0.934	0.987	0.909	1.62	0.342	0.349	0.618

Ground-Water Elevations

Date		9/20/96	12/6/96	3/3/97	6/17/97	9/9/97	11/20/97	2/18/98	6/25/98	10/6/98	12/4/98
MW-1A	NA	576.00	576.05	575.89	575.74	575.75	575.00	574.85	575.76	575.09	574.56
MW-1B	NA	575.91	575.95	575.83	575.68	575.64	574.94	574.77	575.66	574.99	574.54
MW-5A	NA	569.58	570.23	570.25	569.07	568.36	568.75	567.00	569.51	569.00	568.91
MW-5B	NA	569.56	570.22	570.26	569.30	568.45	568.37	566.97	569.60	569.10	569.09
MW-7	NA	566.72	568.28	568.31	565.83	566.11	566.12	567.94	566.59	566.04	567.12
MW-14	NA	574.10	574.35	574.27	573.79	573.84	573.19	573.10	573.86	573.24	572.90
MW-20A	NA	569.53	570.23	570.26	569.39	568.09	568.47	567.11	569.06	568.53	568.51
MW-20B	NA	569.54	570.26	570.29	569.41	567.61	569.20	568.22	569.66	569.13	568.91
MW-22R	NA	567.85	569.21	569.23	567.72	567.73	567.88	573.24	568.15	569.21	569.63
MW-23A	NA	570.99	571.74	571.75	570.90	570.73	570.48	570.58	571.06	570.00	570.29
MW-24A	NA	567.68	569.66	569.68	568.26	568.37	568.38	567.26	568.96	568.36	567.76

Notes: All units in mg/ℓ
MDL=Method Detection Limit.
Ground water elevations measured in feet above mean sea level.

Table 8. Ground-Water Elevation and Apparent LNAPL Thickness Measurements for Past Disposal Area Wells. Solutia, Inc., Nitro, West Virginia.

Date		Depth to Water (ft. TOC)	Depth to Product (ft. TOC)	Apparent Product Thickness (feet)	Corrected Ground-Water Elevation (ft. MSL)	Product Elevation (ft. MSL)
EW-1						
09/12/95		--	--	--	--	--
07/16/96		--	--	--	--	--
10/07/96		--	--	--	--	--
07/10/97		--	--	--	--	--
10/28/97	(1)	27.98	26.60	1.38	566.89	567.19
11/03/97	(1)	28.15	26.65	1.50	566.81	567.14
11/20/97	(1)	28.00	26.56	1.44	566.91	567.23
12/16/97	(1)	--	--	--	--	--
01/28/98	(1)	27.15	26.32	0.83	567.29	567.47
03/02/98	(1)	--	--	--	--	--
03/09/98	(1)	26.41	ND	0.00	567.38	ND
03/14/98	(1)	--	--	--	--	--
03/30/98		26.45	ND	0.00	567.34	ND
04/08/98	(2)	--	--	--	--	--
04/17/98	(2)	--	--	--	--	--
04/22/98	(2)	--	--	--	--	--
05/04/98	(2)	--	--	--	--	--
05/26/98	(2)	--	--	--	--	--
06/03/98	(2)	--	--	--	--	--
06/25/98	(2)	--	--	--	--	--
07/08/98	(2)	--	--	--	--	--
07/17/98	(2)	--	--	--	--	--
08/11/98	(2)	--	--	--	--	--
08/17/98		--	--	--	--	--
08/25/98		--	--	--	--	--
09/08/98		--	--	--	--	--
09/14/98		--	--	--	--	--
12/04/98		--	--	--	--	--
12/22/98		27.85	26.70	1.15	566.84	567.09
		Top of Casing Elev. =	593.79	(ft. MSL)		

Abbreviations:

ft. TOC = Measured in feet from top of well casing
ft. MSL = Measured in feet above Mean Sea Level
ppm = parts per million
SU = Standard Units
mg/l = milligrams per liter
-- = Not Sampled
ND = Not Detected
(1) = Site Pro Pump Inoperative
(2) = Site Pro Pump in well
(3) = Ferret Passive Pump in Well

Table 8. Ground-Water Elevation and Apparent LNAPL Thickness Measurements for Past Disposal Area Wells. Solutia, Inc., Nitro, West Virginia.

Date	Depth to Water (ft. TOC)	Depth to Product (ft. TOC)	Apparent Product Thickness (feet)	Corrected Ground-Water Elevation (ft. MSL)	Product Elevation (ft. MSL)
EW-2					
09/12/95	--	--	--	--	--
07/16/96	--	--	--	--	--
10/07/96	--	--	--	--	--
07/10/97	--	--	--	--	--
10/28/97	26.64	ND	0.00	566.93	ND
11/03/97	26.70	ND	0.00	566.87	ND
11/20/97	26.58	ND	0.00	566.99	ND
12/16/97	26.72	ND	0.00	566.85	ND
01/28/98	26.23	ND	0.00	567.34	ND
03/02/98	25.90	ND	0.00	567.67	ND
03/09/98	26.15	ND	0.00	567.42	ND
03/14/98	26.08	ND	0.00	567.49	ND
03/30/98	26.20	ND	0.00	567.37	ND
04/08/98	26.41	ND	0.00	567.16	ND
04/17/98	26.47	ND	0.00	567.10	ND
04/22/98	26.47	ND	0.00	567.10	ND
05/04/98	25.78	ND	0.00	567.79	ND
05/26/98	26.25	ND	0.00	567.32	ND
06/03/98	26.46	ND	0.00	567.11	ND
06/25/98	26.37	ND	0.00	567.20	ND
07/08/98	26.37	ND	0.00	567.20	ND
07/17/98	26.50	ND	0.00	567.07	ND
08/11/98	26.56	ND	0.00	567.01	ND
08/17/98	26.62	ND	0.00	566.95	ND
08/25/98	26.47	ND	0.00	567.10	ND
09/08/98	26.51	ND	0.00	567.06	ND
09/14/98	26.56	ND	0.00	567.01	ND
12/04/98	26.59	ND	0.00	566.98	ND
12/22/98	26.67	ND	0.00	566.90	ND

Top of Casing Elev. = 593.57 (ft. MSL)

Abbreviations:

ft. TOC = Measured in feet from top of well casing
ft. MSL = Measured in feet above Mean Sea Level
ppm = parts per million
SU = Standard Units
mg/l = milligrams per liter
-- = Not Sampled
ND = Not Detected
(1) = Site Pro Pump Inoperative
(2) = Site Pro Pump in well
(3) = Ferret Passive Pump in Well

Table 8. Ground-Water Elevation and Apparent LNAPL Thickness Measurements for Past Disposal Area Wells.
Solutia, Inc., Nitro, West Virginia.

Date	Depth to Water (ft. TOC)	Depth to Product (ft. TOC)	Apparent Product Thickness (feet)	Corrected Ground-Water Elevation (ft. MSL)	Product Elevation (ft. MSL)
EW-3					
09/12/95	--	--	--	--	--
07/16/96	--	--	--	--	--
10/07/96	--	--	--	--	--
07/10/97	--	--	--	--	--
10/28/97	26.72	ND	0.00	566.96	ND
11/03/97	26.80	ND	0.00	566.88	ND
11/20/97	26.59	ND	0.00	566.99	ND
12/16/97	26.78	ND	0.00	566.90	ND
01/28/98	26.33	ND	0.00	567.35	ND
03/02/98	26.00	ND	0.00	567.68	ND
03/09/98	26.22	ND	0.00	567.46	ND
03/14/98	26.15	ND	0.00	567.53	ND
03/30/98	26.25	ND	0.00	567.43	ND
04/08/98	26.50	ND	0.00	567.18	ND
04/17/98	26.51	ND	0.00	567.17	ND
04/22/98	26.51	ND	0.00	567.17	ND
05/04/98	25.82	ND	0.00	567.86	ND
05/26/98	26.29	ND	0.00	567.39	ND
06/03/98	26.50	ND	0.00	567.18	ND
06/25/98	26.41	ND	0.00	567.27	ND
07/08/98	26.40	ND	0.00	567.28	ND
07/17/98	26.54	ND	0.00	567.14	ND
08/11/98	26.60	ND	0.00	567.08	ND
08/17/98	26.67	ND	0.00	567.01	ND
08/25/98	26.51	ND	0.00	567.17	ND
09/08/98	26.57	ND	0.00	567.11	ND
09/14/98	26.61	ND	0.00	567.07	ND
12/04/98	26.61	ND	0.00	567.07	ND
12/22/98	26.74	ND	0.00	566.94	ND

Top of Casing Elev. = 593.68 (ft. MSL)

Abbreviations:

ft. TOC = Measured in feet from top of well casing
ft. MSL = Measured in feet above Mean Sea Level
ppm = parts per million
SU = Standard Units
mg/l = milligrams per liter
-- = Not Sampled
ND = Not Detected
(1) = Site Pro Pump Inoperative
(2) = Site Pro Pump in well
(3) = Ferret Passive Pump in Well

Table 8. Ground-Water Elevation and Apparent LNAPL Thickness Measurements for Past Disposal Area Wells. Solutia, Inc., Nitro, West Virginia.

Date	Depth to Water (ft. TOC)	Depth to Product (ft. TOC)	Apparent Product Thickness (feet)	Corrected Ground-Water Elevation (ft. MSL)	Product Elevation (ft. MSL)
EW-4					
09/12/95	--	--	--	--	--
07/16/96	--	--	--	--	--
10/07/96	--	--	--	--	--
07/10/97	--	--	--	--	--
10/28/97	25.86	ND	0.00	557.06	ND
11/03/97	25.92	ND	0.00	557.00	ND
11/20/97	26.68	ND	0.00	566.99	ND
12/16/97	25.95	ND	0.00	556.97	ND
01/28/98	25.53	ND	0.00	557.39	ND
03/02/98	25.15	ND	0.00	557.77	ND
03/09/98	25.36	ND	0.00	557.56	ND
03/14/98	25.27	ND	0.00	557.65	ND
03/30/98	25.41	ND	0.00	557.51	ND
04/08/98	25.62	ND	0.00	557.30	ND
04/17/98	25.66	ND	0.00	557.26	ND
04/22/98	25.66	ND	0.00	557.26	ND
05/04/98	24.96	ND	0.00	557.96	ND
05/26/98	25.42	ND	0.00	557.50	ND
06/03/98	25.65	ND	0.00	557.27	ND
06/25/98	26.51	ND	0.00	556.41	ND
07/08/98	25.53	ND	0.00	557.39	ND
07/17/98	25.66	ND	0.00	557.26	ND
08/11/98	25.74	ND	0.00	557.18	ND
08/17/98	25.80	ND	0.00	557.12	ND
08/25/98	25.65	ND	0.00	557.27	ND
09/08/98	25.70	ND	0.00	557.22	ND
09/14/98	25.75	ND	0.00	557.17	ND
12/04/98	25.80	ND	0.00	557.12	ND
12/22/98	25.91	ND	0.00	557.01	ND

Top of Casing Elev. = 582.92 (ft. MSL)

Abbreviations:

ft. TOC = Measured in feet from top of well casing
ft. MSL = Measured in feet above Mean Sea Level
ppm = parts per million
SU = Standard Units
mg/l = milligrams per liter
-- = Not Sampled
ND = Not Detected
(1) = Site Pro Pump Inoperative
(2) = Site Pro Pump in well
(3) = Ferret Passive Pump in Well

Table 8. Ground-Water Elevation and Apparent LNAPL Thickness Measurements for Past Disposal Area Wells.
Solutia, Inc., Nitro, West Virginia.

Date	Depth to Water (ft. TOC)	Depth to Product (ft. TOC)	Apparent Product Thickness (feet)	Corrected Ground-Water Elevation (ft. MSL)	Product Elevation (ft. MSL)
MW-7					
09/12/95	28.59	26.75	1.84	566.88	567.28
07/16/96	30.10	27.70	2.40	565.80	566.33
10/07/96	--	--	--	--	--
07/10/97	--	--	--	--	--
10/28/97	28.90	26.91	1.99	566.68	567.12
11/03/97	28.75	26.85	1.90	566.76	567.18
11/20/97	30.20	27.26	2.94	566.12	566.77
12/16/97	30.52	26.90	3.62	566.33	567.13
01/28/98	28.01	26.65	1.36	567.08	567.38
03/02/98	26.66	26.35	0.31	567.61	567.68
03/09/98	27.19	26.60	0.59	567.30	567.43
03/14/98	26.99	26.47	0.52	567.45	567.56
03/30/98	26.75	26.55	0.20	567.44	567.48
04/08/98	27.36	26.81	0.55	567.10	567.22
04/17/98	27.55	26.81	0.74	567.06	567.22
04/22/98	27.55	26.81	0.74	567.06	567.22
05/04/98	26.55	26.40	0.15	567.60	567.63
05/26/98	27.52	26.64	0.88	567.20	567.39
06/03/98	27.81	26.80	1.01	567.01	567.23
06/25/98	27.39	26.75	0.64	567.14	567.28
07/08/98	27.80	26.71	1.09	567.08	567.32
07/17/98	28.26	26.80	1.46	566.91	567.23
08/11/98	28.42	26.84	1.58	566.84	567.19
08/17/98	28.50	26.84	1.66	566.82	567.19
08/25/98	28.40	26.76	1.64	566.91	567.27
09/08/98	28.49	26.80	1.69	566.86	567.23
09/14/98	28.58	26.81	1.77	566.83	567.22
12/04/98	28.76	26.82	1.94	566.78	567.21
12/22/98	28.77	26.85	1.92	566.76	567.18
	Top of Casing Elev. =	**594.03**	**(ft. MSL)**		

Abbreviations:

ft. TOC = Measured in feet from top of well casing
ft. MSL = Measured in feet above Mean Sea Level
ppm = parts per million
SU = Standard Units
mg/l = milligrams per liter
-- = Not Sampled
ND = Not Detected
(1) = Site Pro Pump Inoperative
(2) = Site Pro Pump in well
(3) = Ferret Passive Pump in Well

Table 8. Ground-Water Elevation and Apparent LNAPL Thickness Measurements for Past Disposal Area Wells.
Solutia, Inc., Nitro, West Virginia.

Date	Depth to Water (ft. TOC)	Depth to Product (ft. TOC)	Apparent Product Thickness (feet)	Corrected Ground-Water Elevation (ft. MSL)	Product Elevation (ft. MSL)
W-1					
09/12/95	29.02	27.79	1.23	566.90	567.17
07/16/96	28.86	28.41	0.45	566.45	566.55
10/07/96	--	--	--	--	--
07/10/97	--	--	--	--	--
10/28/97	28.20	28.10	0.10	566.84	566.86
11/03/97	28.26	28.15	0.11	566.79	566.81
11/20/97	28.25	28.02	0.23	566.89	566.94
12/16/97	28.40	28.20	0.20	566.72	566.76
01/28/98	27.90	27.69	0.21	567.22	567.27
03/02/98	27.35	ND	0.00	567.61	ND
03/09/98	27.83	ND	0.0.0	567.13	ND
03/14/98	27.76	27.57	0.19	567.35	567.39
03/30/98	27.80	27.76	0.04	567.19	567.20
04/08/98	28.05	27.88	0.17	567.04	567.08
04/17/98	28.12	27.94	0.18	566.98	567.02
04/22/98	28.12	27.44	0.68	567.37	567.52
05/04/98	27.40	27.27	0.13	567.66	567.69
05/26/98	27.71	27.64	0.07	567.30	567.32
06/03/98	28.12	27.95	0.17	566.97	567.01
06/25/98	28.01	27.80	0.21	567.11	567.16
07/08/98	28.02	27.85	0.17	567.07	567.11
07/17/98	28.17	27.98	0.19	566.94	566.98
08/11/98	28.22	28.04	0.18	566.88	566.92
08/17/98	28.32	28.11	0.21	566.80	566.85
08/25/98	28.12	27.96	0.16	566.96	567.00
09/08/98	28.18	28.00	0.18	566.92	566.96
09/14/98	28.20	28.02	0.18	566.90	566.94
12/04/98	28.06	ND	0.00	566.90	ND
12/22/98	28.33	28.14	0.19	566.78	566.82

Top of Casing Elev. = 594.96 (ft. MSL)

Abbreviations:

ft. TOC = Measured in feet from top of well casing
ft. MSL = Measured in feet above Mean Sea Level
ppm = parts per million
SU = Standard Units
mg/l = milligrams per liter
-- = Not Sampled
ND = Not Detected
(1) = Site Pro Pump Inoperative
(2) = Site Pro Pump in well
(3) = Ferret Passive Pump in Well

Table 8. Ground-Water Elevation and Apparent LNAPL Thickness Measurements for Past Disposal Area Wells. Solutia, Inc., Nitro, West Virginia.

Date	Depth to Water (ft. TOC)	Depth to Product (ft. TOC)	Apparent Product Thickness (feet)	Corrected Ground-Water Elevation (ft. MSL)	Product Elevation (ft. MSL)
R-2					
09/12/95	--	--	--	--	--
07/16/96	--	--	--	--	--
10/07/96	--	--	--	--	--
07/10/97	--	--	--	--	--
10/28/97	27.29	25.75	1.54	566.83	567.17
11/03/97	27.25	25.81	1.44	566.79	567.11
11/20/97	27.22	25.67	1.55	566.91	567.25
12/16/97	27.49	25.80	1.69	566.75	567.12
01/28/98	26.08	25.61	0.47	567.21	567.31
03/02/98	25.70	25.18	0.52	567.63	567.74
03/09/98	25.91	25.49	0.42	567.34	567.43
03/14/98	25.40	25.38	0.02	567.54	567.54
03/30/98	25.64	25.62	0.02	567.30	567.30
04/08/98	25.86	25.81	0.05	567.10	567.11
04/17/98	25.91	25.85	0.06	567.06	567.07
04/22/98	25.91	25.85	0.06	567.06	567.07
05/04/98	25.25	25.19	0.06	567.72	567.73
05/26/98	25.68	25.65	0.03	567.26	567.27
06/03/98	25.90	25.83	0.07	567.07	567.09
06/25/98	25.85	25.71	0.14	567.18	567.21
07/08/98	25.86	25.75	0.11	567.15	567.17
07/17/98	25.99	25.89	0.10	567.01	567.03
08/11/98	26.39	25.87	0.52	566.94	567.05
08/17/98	26.41	25.94	0.47	566.88	566.98
08/25/98	26.37	25.77	0.60	567.02	567.15
09/08/98	26.61	25.78	0.83	566.96	567.14
09/14/98	26.74	25.78	0.96	566.93	567.14
12/04/98	27.22	25.7	1.52	566.89	567.22
12/22/98	27.31	25.82	1.49	566.77	567.10
	Top of Casing Elev. =	**592.92**	**(ft. MSL)**		

Abbreviations:

ft. TOC = Measured in feet from top of well casing
ft. MSL = Measured in feet above Mean Sea Level
ppm = parts per million
SU = Standard Units
mg/l = milligrams per liter
-- = Not Sampled
ND = Not Detected
(1) = Site Pro Pump Inoperative
(2) = Site Pro Pump in well
(3) = Ferret Passive Pump in Well

Table 8. **Ground-Water Elevation and Apparent LNAPL Thickness Measurements for Past Disposal Area Wells. Solutia Inc., Nitro, West Virginia.**

Date		Depth to Water (ft. TOC)	Depth to Product (ft. TOC)	Apparent Product Thickness (feet)	Corrected Ground-Water Elevation (ft. MSL)	Product Elevation (ft. MSL)
B-1						
09/12/95		29.46	27.77	1.69	566.84	567.21
07/16/96		29.75	28.06	1.69	566.55	566.92
08/09/96		29.21	27.88	1.33	566.81	567.10
10/28/97	(3)	--	--	--	--	--
11/03/97	(3)	30.10	28.10	2.00	566.44	566.88
11/20/97	(3)	30.65	30.62	0.03	564.35	564.36
12/16/97	(3)	--	--	--	--	--
01/28/98	(3)	29.03	27.69	1.34	567.00	567.29
03/02/98	(3)	27.90	27.34	0.56	567.52	567.64
03/09/98	(3)	29.80	29.40	0.40	565.49	565.58
03/14/98	(3)	28.12	27.56	0.56	567.30	567.42
03/30/98		28.35	ND	0.00	566.63	ND
04/08/98	(3)	--	--	--	--	--
04/17/98		29.05	28.09	0.96	566.68	566.89
04/22/98		29.05	28.09	0.96	566.68	566.89
05/04/98		27.95	27.60	0.35	567.30	567.38
05/26/98		28.41	27.73	0.68	567.10	567.25
06/03/98		28.15	ND	0.00	566.83	ND
06/25/98		29.89	28.21	1.68	566.40	566.77
07/08/98		28.80	27.76	1.04	566.99	567.22
07/17/98		29.20	27.85	1.35	566.83	567.13
08/11/98		29.43	28.88	0.55	565.98	566.10
08/17/98		29.46	27.87	1.59	566.76	567.11
08/25/98		29.40	27.81	1.59	566.82	567.17
09/08/98		29.49	27.82	1.67	566.79	567.16
09/14/98		29.56	27.86	1.70	566.75	567.12
12/04/98		29.72	27.85	1.87	566.72	567.13
12/22/98		29.70	27.85	1.85	566.72	567.13
		Top of Casing Elev. =	**594.98**	**(ft. MSL)**		

Abbreviations:

ft. TOC = Measured in feet from top of well casing
ft. MSL = Measured in feet above Mean Sea Level
ppm = parts per million
SU = Standard Units
mg/l = milligrams per liter
-- = Not Sampled
ND = Not Detected
(1) = Site Pro Pump Inoperative
(2) = Site Pro Pump in well
(3) = Ferret Passive Pump in Well

Table 8. Ground-Water Elevation and Apparent LNAPL Thickness Measurements for Past Disposal Area Wells. Solutia, Inc., Nitro, West Virginia.

Date		Depth to Water (ft. TOC)	Depth to Product (ft. TOC)	Apparent Product Thickness (feet)	Corrected Ground-Water Elevation (ft. MSL)	Product Elevation (ft. MSL)
B-2						
09/15/95		26.8	25.57	1.23	567.03	567.30
07/16/96		27.58	25.91	1.67	566.59	566.96
10/07/96		--	--	--	--	--
07/10/97		--	--	--	--	--
10/28/97	(3)	27.57	26.45	1.12	566.17	566.42
11/03/97	(3)	27.71	26.50	1.21	566.10	566.37
11/20/97	(3)	27.45	26.35	1.10	566.28	566.52
12/16/97	(3)	27.80	26.50	1.30	566.08	566.37
01/28/98	(3)	26.42	25.41	1.01	567.24	567.46
03/02/98	(3)	25.16	ND	0.00	567.71	ND
03/09/98	(3)	26.65	25.48	1.17	567.13	567.39
03/14/98	(3)	25.65	25.31	0.34	567.49	567.56
03/30/98		25.60	25.43	0.17	567.40	567.44
04/08/98		25.81	25.65	0.16	567.18	567.22
04/17/98		25.91	25.70	0.21	567.12	567.17
04/22/98		25.91	25.70	0.21	567.12	567.17
05/04/98		25.28	25.00	0.28	567.81	567.87
05/26/98		25.80	25.48	0.32	567.32	567.39
06/03/98		26.18	25.60	0.58	567.14	567.27
06/25/98		26.15	24.45	1.70	568.05	568.42
07/08/98		26.18	25.44	0.74	567.27	567.43
07/17/98		26.45	25.60	0.85	567.08	567.27
08/11/98		26.69	25.65	1.04	566.99	567.22
08/17/98		26.71	25.65	1.06	566.99	567.22
08/25/98		26.58	25.60	0.98	567.05	567.27
09/08/98		26.66	25.61	1.05	567.03	567.26
09/14/98		26.69	25.61	1.08	567.02	567.26
12/04/98		26.78	25.66	1.12	566.96	567.21
12/22/98		27.02	25.77	1.25	566.83	567.10

Top of Casing Elev. = 592.87 (ft. MSL)

Abbreviations:

ft. TOC = Measured in feet from top of well casing
ft. MSL = Measured in feet above Mean Sea Level
ppm = parts per million
SU = Standard Units
mg/l = milligrams per liter
-- = Not Sampled
ND = Not Detected
(1) = Site Pro Pump Inoperative
(2) = Site Pro Pump in well
(3) = Ferret Passive Pump in Well

Table 8. Ground-Water Elevation and Apparent LNAPL Thickness Measurements for Past Disposal Area Wells.
Solutia, Inc., Nitro, West Virginia.

Date		Depth to Water (ft. TOC)	Depth to Product (ft. TOC)	Apparent Product Thickness (feet)	Corrected Ground-Water Elevation (ft. MSL)	Product Elevation (ft. MSL)
B-3						
09/15/95		29.76	27.80	1.96	566.91	567.34
07/16/96		30.36	28.16	2.20	566.50	566.98
10/07/96		--	--	--	--	--
07/10/97		--	--	--	--	--
10/28/97	(3)	29.95	27.86	2.09	566.82	567.28
11/03/97	(3)	29.88	27.85	2.03	566.84	567.29
11/20/97	(3)	29.81	27.81	2.00	566.89	567.33
12/16/97	(3)	--	--	--	--	--
01/28/98	(3)	29.60	28.11	1.49	566.70	567.03
03/02/98	(3)	27.70	ND	0.00	567.44	ND
03/09/98	(3)	28.55	ND	0.00	566.59	ND
03/14/98	(3)	28.01	ND	0.00	567.13	ND
03/30/98		27.88	ND	0.00	567.26	ND
04/08/98		28.15	ND	0.00	566.99	ND
04/17/98		28.78	28.08	0.70	566.91	567.06
04/22/98		28.78	28.08	0.70	566.91	567.06
05/04/98		28.07	27.76	0.31	567.31	567.38
05/26/98		29.05	28.00	1.05	566.91	567.14
06/03/98		30.20	28.03	2.17	566.63	567.11
06/25/98		28.62	28.10	0.52	566.93	567.04
07/08/98		28.91	27.77	1.14	567.12	567.37
07/17/98		29.51	27.80	1.71	566.96	567.34
08/11/98		29.64	27.84	1.80	566.90	567.30
08/17/98		29.56	27.85	1.71	566.91	567.29
08/25/98		29.65	27.80	1.85	566.93	567.34
09/08/98		29.67	27.82	1.85	566.91	567.32
09/14/98		29.81	27.82	1.99	566.88	567.32
12/04/98		29.94	27.86	2.08	566.82	567.28
12/22/98		29.89	27.87	2.02	566.83	567.27

Top of Casing Elev. = 595.14 (ft. MSL)

Abbreviations:

ft. TOC = Measured in feet from top of well casing
ft. MSL = Measured in feet above Mean Sea Level
ppm = parts per million
SU = Standard Units
mg/l = milligrams per liter
-- = Not Sampled
ND = Not Detected
(1) = Site Pro Pump Inoperative
(2) = Site Pro Pump in well
(3) = Ferret Passive Pump in Well

Table 8. Ground-Water Elevation and Apparent LNAPL Thickness Measurements for Past Disposal Area Wells. Solutia, Inc., Nitro, West Virginia.

Date	Depth to Water (ft. TOC)	Depth to Product (ft. TOC)	Apparent Product Thickness (feet)	Corrected Ground-Water Elevation (ft. MSL)	Product Elevation (ft. MSL)
B-4					
09/12/95	27.15	26.76	0.39	566.97	567.06
07/16/96	27.18	ND	0.00	566.95	ND
10/07/96	--	--	--	--	--
07/10/97	--	--	--	--	--
10/28/97	27.55	26.80	0.75	566.86	567.02
11/03/97	27.61	26.78	0.83	566.86	567.04
11/20/97	27.82	26.69	1.13	566.88	567.13
12/16/97	28.45	26.71	1.74	566.73	567.11
01/28/98	27.21	26.48	0.73	567.18	567.34
03/02/98	26.46	26.03	0.43	567.70	567.79
03/09/98	26.67	26.32	0.35	567.42	567.50
03/14/98	26.54	26.19	0.35	567.55	567.63
03/30/98	26.55	26.22	0.33	567.53	567.60
04/08/98	26.86	26.58	0.28	567.18	567.24
04/17/98	26.91	26.60	0.31	567.15	567.22
04/22/98	26.91	26.60	0.31	567.15	567.22
05/04/98	26.31	26.07	0.24	567.70	567.75
05/26/98	26.71	26.51	0.20	567.27	567.31
06/03/98	26.93	26.66	0.27	567.10	567.16
06/25/98	26.80	26.55	0.25	567.22	567.27
07/08/98	26.82	26.60	0.22	567.17	567.22
07/17/98	27.03	26.75	0.28	567.01	567.07
08/11/98	27.81	26.82	0.99	566.78	567.00
08/17/98	27.11	26.81	0.30	566.94	567.01
08/25/98	27.07	26.77	0.30	566.98	567.05
09/08/98	27.12	26.78	0.34	566.97	567.04
09/14/98	27.18	26.81	0.37	566.93	567.01
12/04/98	28.15	26.62	1.53	566.86	567.20
12/22/98	28.28	26.61	1.67	566.84	567.21
	Top of Casing Elev. =	**593.82**	**(ft. MSL)**		

Abbreviations:

ft. TOC = Measured in feet from top of well casing
ft. MSL = Measured in feet above Mean Sea Level
ppm = parts per million
SU = Standard Units
mg/l = milligrams per liter
-- = Not Sampled
ND = Not Detected
(1) = Site Pro Pump Inoperative
(2) = Site Pro Pump in well
(3) = Ferret Passive Pump in Well

Table 9. Comparison of Apparent and Actual LNAPL Thickness. Solutia, Inc., Nitro, West Virginia.

Well	Apparent LNAPL Thickness (Feet)	Actual LNAPL Thickness (Feet)	Ratio of Apparent of Actual Thickness
MW-7	1.64	0.24	6.8:1
W-1	0.18	0	--
B-1	1.81	Not Determined	--
B-2	1.25	0.40	3.1:1
B-3	2.08	Not Determined	--
B-4	1.5	0.10	15:1
R-2	1.57	0.70	2.2:1
EW-1	1.15	Not Tested	--

Notes:
Wells listed above are those with detectable product.
EW-1 could not be tested due to the rapid water recovery rate.
Actual thicknesses are listed as "less than" where product thickness was decreasing at the end of the test.
-- = Not applicable.
The tests on wells B-1 and B-3 did not give conclusive results. No inflection point was identified in the depth to groundwater curve.

Table 10. Summary of Volatile Organic Analytical Results for TCE Hot Spot Extraction Wells. Solutia, Inc., Nitro, West Virginia.

Extraction Well Designation			EW-5A		EW-5B		EW-6A			EW-6B			
Sample Date			2/13/97	8/6/97	2/13/97	11/3/97	2/13/97	5/9/97	7/22/97	2/13/97	7/23/97	8/11/97	9/4/97
Event			Pre-Startup	At Startup	Pre-Startup	At Startup	Pre-Startup	At Startup	Operation	Pre-Startup	At Startup	Operation	Operation
Parameter	MQL	Units											
Acrolein	0.05	mg/l		<0.05		<0.1		<0.05	<0.05		<0.05	<0.05	<0.05
Acrylonitrile	0.05	mg/l		<0.05		<0.1		<0.05	<0.05		<0.05	<0.05	<0.05
Benzene	0.005	mg/l	0.036	0.217	0.03	0.043	0.01	0.005	0.046	0.041	0.005	0.051	0.061
Bromoform	0.005	mg/l		<0.005		<0.1		<0.005	<0.005		<0.005	<0.005	<0.005
Carbon tetrachloride	0.005	mg/l		<0.005		<0.1		0.021	0.06		0.023	0.048	0.065
Chlorobenzene	0.005	mg/l	0.018	0.089	0.162	0.137	0.014	0.015	0.047	0.279	0.021	0.046	0.051
Chlorodibromomethane	0.005	mg/l		<0.005		<0.1		<0.005	<0.005		<0.005	<0.005	<0.005
Chloroethane	0.005	mg/l		<0.005		<0.1		<0.005	<0.005		<0.005	<0.005	<0.005
2-Chloroethyl vinyl ether	0.005	mg/l		<0.005		N/A		<0.005	<0.005		<0.005	N/A	N/A
Chloroform	0.005	mg/l		0.058		0.105		0.016	0.023		0.017	0.022	0.021
cis-1,3-Dichloropropylene	0.005	mg/l		<0.005		<0.1		<0.005	<0.005		<0.005	<0.005	<0.005
Dichlorobromomethane	0.005	mg/l		<0.005		<0.1		<0.005	<0.005		<0.005	<0.005	<0.005
1,1-Dichlorethane	0.005	mg/l		<0.005		<0.1		<0.005	<0.005		<0.005	<0.005	<0.005
1,2-Dichlorethane	0.005	mg/l		0.03		0.024		<0.005	0.01		<0.005	0.01	0.006
1,1-Dichloroethylene	0.005	mg/l		0.006		<0.1		<0.005	0.007		<0.005	0.006	<0.005
1,2-Dichloropane	0.005	mg/l		<0.005		0.014		<0.005	0.009		<0.005	0.008	0.008
Ethylbenzene	0.005	mg/l		0.012		<0.1		<0.005	<0.005		0.015	<0.005	<0.005
Methyl bromide	0.005	mg/l		<0.005		<0.1		<0.005	<0.005		<0.005	<0.005	<0.005
Methyl chloride	0.005	mg/l		<0.005		<0.1		<0.005	<0.005		<0.005	<0.005	<0.005
Methylene chloride	0.005	mg/l		<0.005		<0.1		<0.005	<0.005		<0.005	<0.005	<0.005
1,1,2,2-Tetrachloroethane	0.005	mg/l		<0.005		<0.1		<0.005	<0.005		<0.005	<0.005	<0.005
Tetrachloroethylene	0.005	mg/l		<0.005		<0.1		<0.005	<0.005		<0.005	<0.005	<0.005
Toluene	0.005	mg/l		0.044		<0.1		<0.005	<0.005		0.006	<0.005	<0.005
trans- 1,2-Dichloroethylene	0.005	mg/l		0.434		0.146		0.142	0.344		0.111	0.454	0.343
trans-1,3-Dichloropropylene	0.005	mg/l		0.489		<0.1		<0.005	<0.005		<0.005	<0.005	<0.005
1,1,1-Trichloroethane	0.005	mg/l		<0.005		<0.1		<0.005	<0.005		<0.005	<0.005	<0.005
1,1,2-Trichloroethane	0.005	mg/l		<0.005		<0.1		<0.005	0.025		<0.005	0.027	0.025
Trichloroethene	0.005	mg/l	2.12	7.36	1.05	0.871	1.3	0.98	1.13	3.42	0.752	1.96	1.32
Vinyl chloride	0.005	mg/l		0.05		0.025		0.011	1.13		0.03	1.19	1.56

Table 10. **Summary of Volatile Organic Analytical Results for TCE Hot Spot Extraction Wells. Solutia, Inc., Nitro, West Virginia.**

Extraction Well Designation			EW-7A		EW-7B		EW-8	
Sample Date			2/13/97	4/11/97	2/13/97	7/16/97	2/13/97	3/19/97
Event			Pre-Startup	At Startup	Pre-Startup	At Startup	Pre-Startup	At Startup
Parameter	MQL	Units						
Acrolein	0.05	mg/l		<0.25				<0.05
Acrylonitrile	0.05	mg/l		<0.25				<0.05
Benzene	0.005	mg/l	0.032	0.027	0.022	0.059	0.028	0.014
Bromoform	0.005	mg/l		<0.025				<0.005
Carbon tetrachloride	0.005	mg/l		<0.025				0.88
Chlorobenzene	0.005	mg/l	0.357	0.453	0.029	<0.01	<0.005	<0.005
Chlorodibromomethane	0.005	mg/l		<0.025				<0.005
Chloroethane	0.005	mg/l		<0.025				<0.005
2-Chloroethyl vinyl ether	0.005	mg/l		<0.025				<0.005
Chloroform	0.005	mg/l		<0.025				0.401
cis-1,3-Dichloropropylene	0.005	mg/l		<0.025				<0.005
Dichlorobromomethane	0.005	mg/l		<0.025				0.006
1,1-Dichlorethane	0.005	mg/l		<0.025				<0.005
1,2-Dichlorethane	0.005	mg/l		<0.025				<0.005
1,1-Dichloroethylene	0.005	mg/l		<0.025				<0.005
1,2-Dichloropane	0.005	mg/l		<0.025				<0.005
Ethylbenzene	0.005	mg/l		0.203				<0.005
Methyl bromide	0.005	mg/l		<0.025				<0.005
Methyl chloride	0.005	mg/l		<0.025				<0.005
Methylene chloride	0.005	mg/l		<0.025				0.008
1,1,2,2-Tetrachloroethane	0.005	mg/l		<0.025				<0.005
Tetrachloroethylene	0.005	mg/l		<0.025				<0.005
Toluene	0.005	mg/l		0.102				0.025
trans- 1,2-Dichloroethylene	0.005	mg/l		3.47				0.06
trans-1,3-Dichloropropylene	0.005	mg/l		<0.025				<0.005
1,1,1-Trichloroethane	0.005	mg/l		<0.025				<0.005
1,1,2-Trichloroethane	0.005	mg/l		<0.025				<0.005
Trichloroethene	0.005	mg/l	4.84	3.4	4	0.942	1.3	0.602
Vinyl chloride	0.005	mg/l		0.063				<0.005

Table 11. Summary of TCE Hot Spot Area Extraction Well and Mass Removal. Solutia, Inc., Nitro, West Virginia.

Extraction Well	Total Flow (gal.)	Extraction Well Startup Date	Extraction Well Shutdown Date	Average Concentration (mg/l)	Average Flow Rate (gpm)	Mass Removed (lbs.)
EW-5A	87,452	8/6/97	4/9/98	4.74	0.247	3.46
EW-5B	575,395	11/3/97	4/9/98	0.96	2.545	4.61
EW-6A	232,767	5/9/97	4/9/98	1.14	0.483	2.21
EW-6B	2,426,537	7/23/97	4/9/98	1.86	6.481	37.73
EW-7A	117,652	4/11/97	4/9/98	4.12	0.225	4.05
EW-7B	5,418,879	3/19/97	4/9/98	2.47	9.749	111.75
EW-8	51,100	2/13/97	4/9/98	0.95	0.084	0.41
Total for all Extraction wells	**8,909,782**	--	--	--	**19.814**	**164.22**

Notes:
gal. = Gallons.
mg/l = Milligrams per liter.
-- = Not calculated.
gpm. = gallons per minute.
lbs. = Pounds.

Table 12. Summary of Benzene and Phenols Analytical Results for Nitro Dump Area Quarterly Performance Monitoring. Solutia, Inc., Nitro, West Virginia.

		Well WT-13A									
Date		**9/19/96**	**12/5/96**	**3/3/97**	**6/17/97**	**9/9/97**	**11/20/97**	**2/18/98**	**6/25/98**	**10/6/98**	**12/4/98**
Parameter	**MDL**										
phenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-chlorophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-nitrophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-dimethylphenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-dichlorophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-chloro,3-methylphenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-trichlorophenol	0.02	0.122	0.193	ND	ND	ND	ND	0.056	ND	ND	ND
2,4-dinitrophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-nitrophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-methyl,4,6-dinitrophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
pentachlorophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-cresol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p-cresol	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-trichlorophenol	0.02	NA	NA	NA	NA	0.175	0.157	ND	ND	0.113	ND
Total Phenolic Compounds	**NA**	**0.122**	**0.193**	**0**	**0**	**0.175**	**0.157**	**0.056**	**0**	**0.113**	**0**
benzene	0.005	0.013	0.005	ND	ND	ND	ND	ND	ND	ND	ND
Ground-Water-Elevation (ft. MSL)		566.63	568.56	568.34	566.43	566.41	566.37	568.17	566.61	566.23	566.26

Notes:
MDL = Method Detection Limit.
ND = Not Detected Above MDL.
NA = Not Analyzed.
MSL = Mean Sea Level.

Table 12. Summary of Benzene and Phenols Analytical Results for Nitro Dump Area Quarterly Performance Monitoring. Solutia, Inc., Nitro, West Virginia.

Date		Well WT-14A									
Parameter	MDL	9/19/96	12/5/96	3/3/97	6/17/97	9/9/97	11/20/97	2/18/98	6/25/98	10/6/98	12/4/98
phenol	0.02	0.341	0.089	ND	0.509	ND	ND	ND	0.108	ND	ND
2-chlorophenol	0.02	0.020	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-nitrophenol	0.02	ND	ND	ND	ND	ND	ND	0.024	ND	ND	ND
2,4-dimethylphenol	0.02	0.307	ND	0.032	0.058	0.097	ND	ND	0.182	ND	ND
2,4-dichlorophenol	0.02	0.067	0.036	ND	ND	0.032	0.024	ND	0.024	0.033	ND
4-chloro,3-methylphenol	0.02	ND	0.167	ND	0.206	ND	ND	ND	0.181	ND	ND
2,4,6-trichlorophenol	0.02	0.187	0.074	ND	0.134	0.108	ND	0.02	ND	ND	ND
2,4-dinitrophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-nitrophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-methyl,4,6-dinitrophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
pentachlorophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-cresol	0.02	0.336	0.031	0.062	0.393	ND	ND	ND	0.113	ND	ND
m,p-cresol	0.04	7.200	2.870	ND	10.400	ND	ND	ND	1.72	ND	ND
2,4,5-trichlorophenol	0.02	NA	NA	NA	NA	ND	0.074	ND	0.102	0.030	ND
Total Phenolic Compounds	NA	**8.458**	**3.267**	**0.094**	**11.700**	**0.237**	**0.098**	**0.044**	**2.430**	**0.063**	**0**
benzene	0.005	1.21	ND	0.496	0.93	0.268	0.034	0.352	0.478	0.008	ND
Ground-Water-Elevation (ft. MSL)		568.14	571.82	572.05	568.84	567.78	566.98	571.95	571.87	567.21	566.74

Notes:
MDL = Method Detection Limit.
ND = Not Detected Above MDL.
NA = Not Analyzed.
MSL = Mean Sea Level.

Table 12. Summary of Benzene and Phenols Analytical Results for Nitro Dump Area Quarterly Performance Monitoring. Solutia, Inc., Nitro, West Virginia.

Date		Well WT-15A									
		9/27/96	12/5/96	3/3/97	6/17/97	9/9/97	11/20/97	2/18/98	6/25/98	10/6/98	12/4/98
Parameter	**MDL**										
phenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-chlorophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-nitrophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-dimethylphenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-dichlorophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-chloro,3-methylphenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-trichlorophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-dinitrophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-nitrophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-methyl,4,6-dinitrophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
pentachlorophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-cresol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p-cresol	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-trichlorophenol	0.02	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND
Total Phenolic Compounds	**NA**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
benzene	0.005	0.009	0.01	ND	0.007	0.008	0.008	0.011	0.008	0.006	ND
Ground-Water-Elevation (ft. MSL)		582.76	582.28	582.23	580.11	580.01	579.17	579.73	581.29	578.79	580.56

Notes:
MDL = Method Detection Limit.
ND = Not Detected Above MDL.
NA = Not Analyzed.
MSL = Mean Sea Level.

Table 12. Summary of Benzene and Phenols Analytical Results for Nitro Dump Area Quarterly Performance Monitoring. Solutia, Inc., Nitro, West Virginia.

Date		Well TD-5									
		9/19/96	12/5/96	3/3/97	6/17/97	9/9/97	11/20/97	2/18/98	6/25/98	10/6/98	12/4/98
Parameter	**MDL**										
phenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-chlorophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-nitrophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-dimethylphenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-dichlorophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-chloro,3-methylphenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-trichlorophenol	0.02	ND	ND	ND	0.186	ND	ND	ND	ND	ND	ND
2,4-dinitrophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-nitrophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-methyl,4,6-dinitrophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
pentachlorophenol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-cresol	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p-cresol	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-trichlorophenol	0.02	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND
Total Phenolic Compounds	**NA**	**0**	**0**	**0**	**0.186**	**0**	**0**	**0**	**0**	**0**	**0**
benzene	0.005	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND
Ground-Water-Elevation (ft. MSL)		566.78	568.64	571.38	566.61	566.59	566.49	568.36	566.76	566.34	566.43

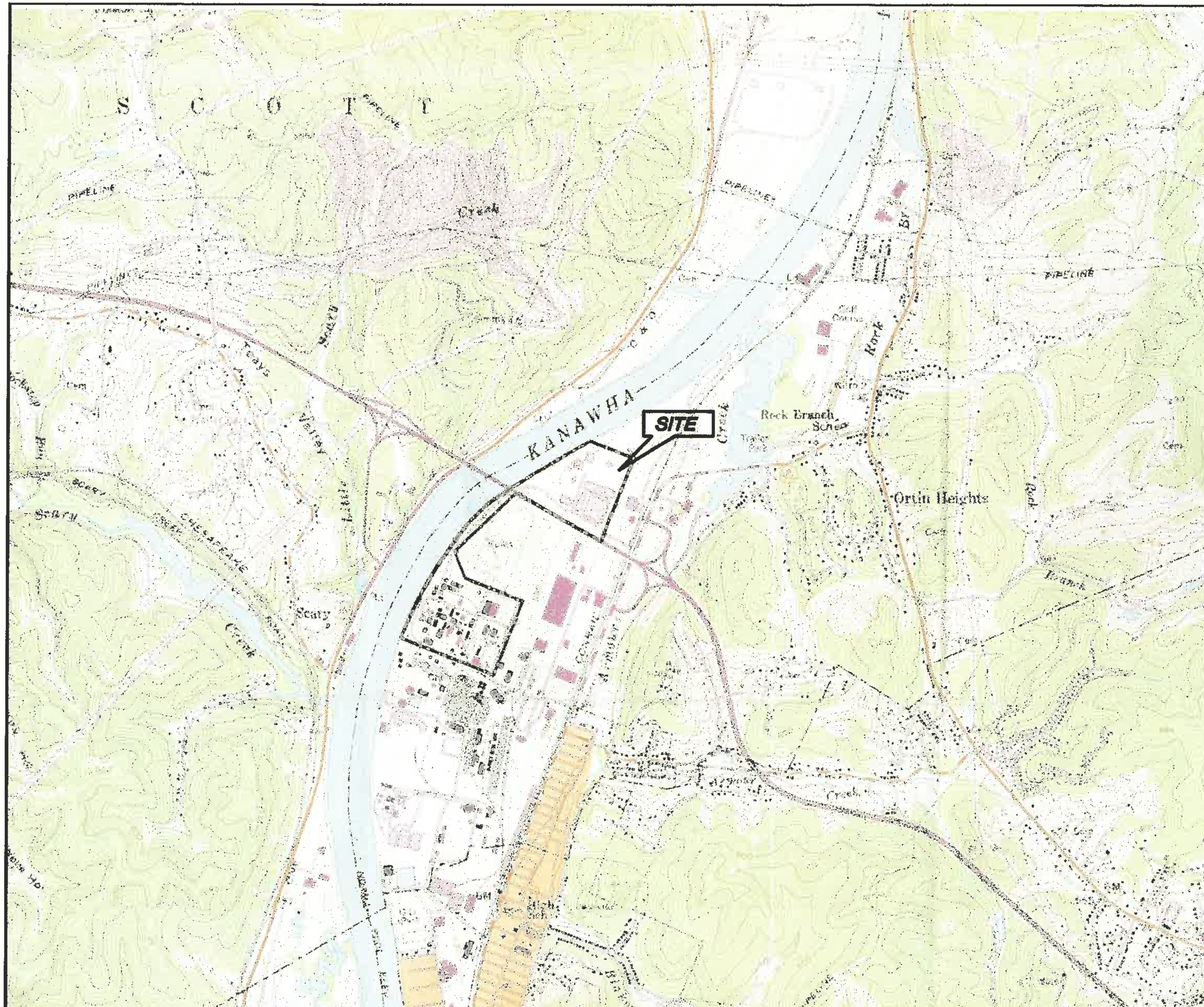
Notes:
MDL = Method Detection Limit.
ND = Not Detected Above MDL.
NA = Not Analyzed.
MSL = Mean Sea Level.

Table 13. Summary of Well WT-14A Nutrient Analysis for Nitro Dump Area Quarterly Performance Monitoring. Solutia, Inc., Nitro, West Virginia.

Date	Ammonia	Nitrate-Nitrite (as N)	Nitrate (as N)	Nitrite (as N)	Ortho-phosphate	pH (in su)	Total Phosphate	TKN
9/9/97	421	67.1			0.48	7.54	1.5	568
11/20/97	81.1		23.5	<0.5	0.55	6.7	0.7	105
2/19/98	29.5	58			0.44	7.67	0.89	34.2
6/26/98	52.2		6.87	<0.5	0.19	7.83	0.71	67.8
10/6/98	120		61.9	<0.5	0.35	7.65	0.76	215
12/4/98		25.2			0.57	7.51	0.68	40.5

SU = Standard Units.
TKN = Total Kljeldahl Nitrogen.
All units in mg/l.

FIGURES



N

QUADRANGLE LOCATION

SOURCE

1.) U.S.G.S. SAINT ALBANS, W.VA., QUADRANGLE 1958
7.5 MINUTES SERIES (TOPOGRAPHIC)
PHOTOREVISED 1971 & 1976

2,000' 0' 2,000'

Title:

SITE LOCATION MAP

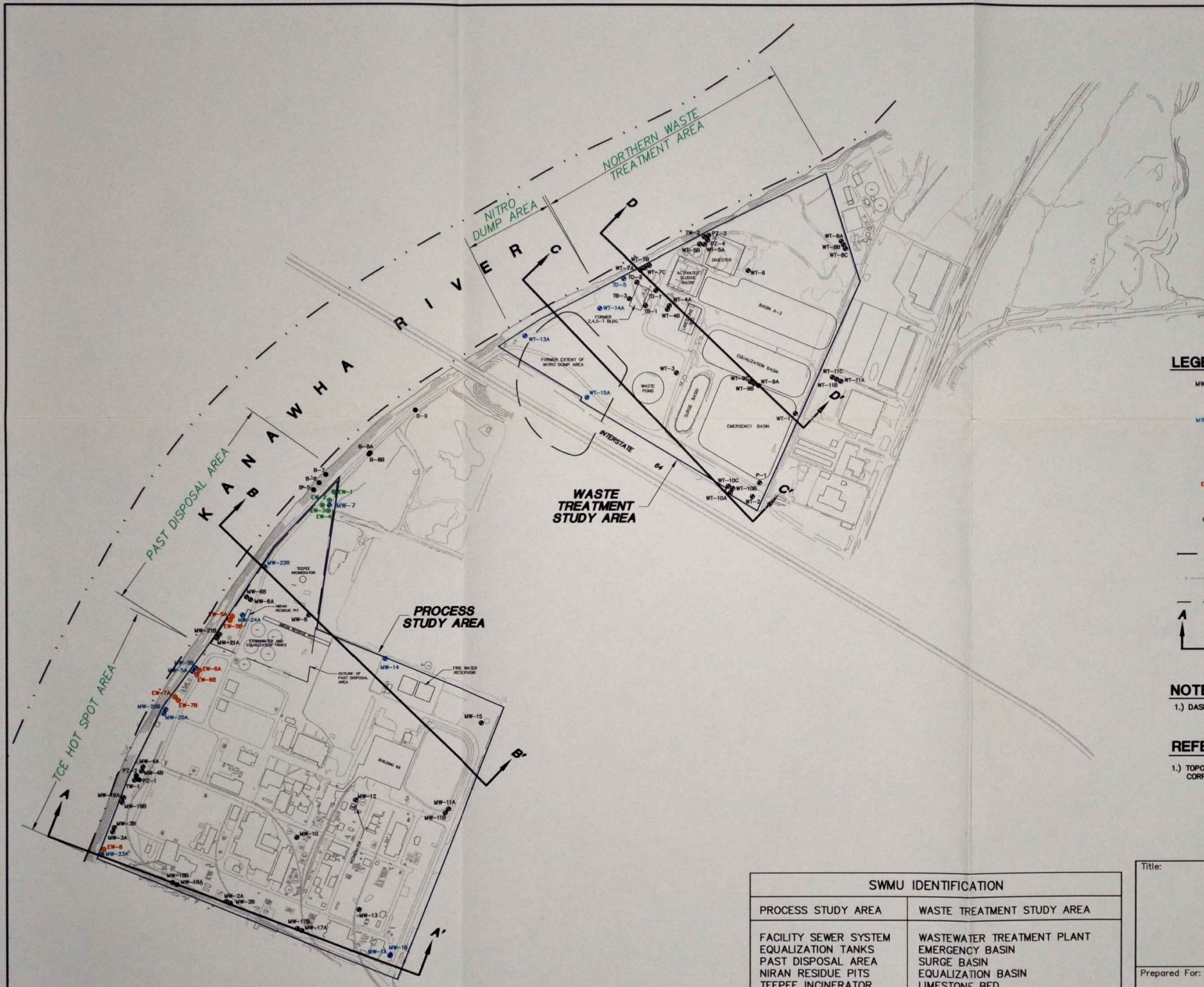
NITRO, WEST VIRGINIA

Prepared For:

SOLUTIA

ROUX
ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: W.B.S.	Date: 1/6/98	Figure
Prepared by: J.R.M.	Scale: SHOWN	1
Project Mgr: P.J.P.	Revision:	
Proj No: 06619J08	File No: 06619137	



LEGEND

MW-6A	MONITORING WELL LOCATION AND IDENTIFICATION
MW-5B	MONITORING WELL LOCATION AND IDENTIFICATION FROM QUARTERLY PERFORMANCE MONITORING PROGRAM
EW-2	LNAPL EXTRACTION WELL LOCATION AND IDENTIFICATION
EW-8	GROUND-WATER EXTRACTION WELL LOCATION AND IDENTIFICATION
PZ-1	PIEZOMETER LOCATION AND IDENTIFICATION
	EDGE OF WATER
	FENCE
	FORMER EXTENT OF NITRO DUMP AREA
A A'	CROS-SECTION LOCATION

NOTE

1.) DASHED CONTOURS EXHIBIT HEAVY FOLIAGE.

REFERENCE

1.) TOPOGRAPHIC MAP PREPARED BY TERRADON CORPORATION DATED 2/17/95.

400' 0' 400'

SWMU IDENTIFICATION	
PROCESS STUDY AREA	WASTE TREATMENT STUDY AREA
FACILITY SEWER SYSTEM EQUALIZATION TANKS PAST DISPOSAL AREA NIRAN RESIDUE PITS TEEPEE INCINERATOR BUILDING 46 INCINERATOR	WASTEWATER TREATMENT PLANT EMERGENCY BASIN SURGE BASIN EQUALIZATION BASIN LIMESTONE BED WASTE POND DECONTAMINATED 2,4,5-T BUILDING CITY OF NITRO DUMP

Title:

SITE PLAN

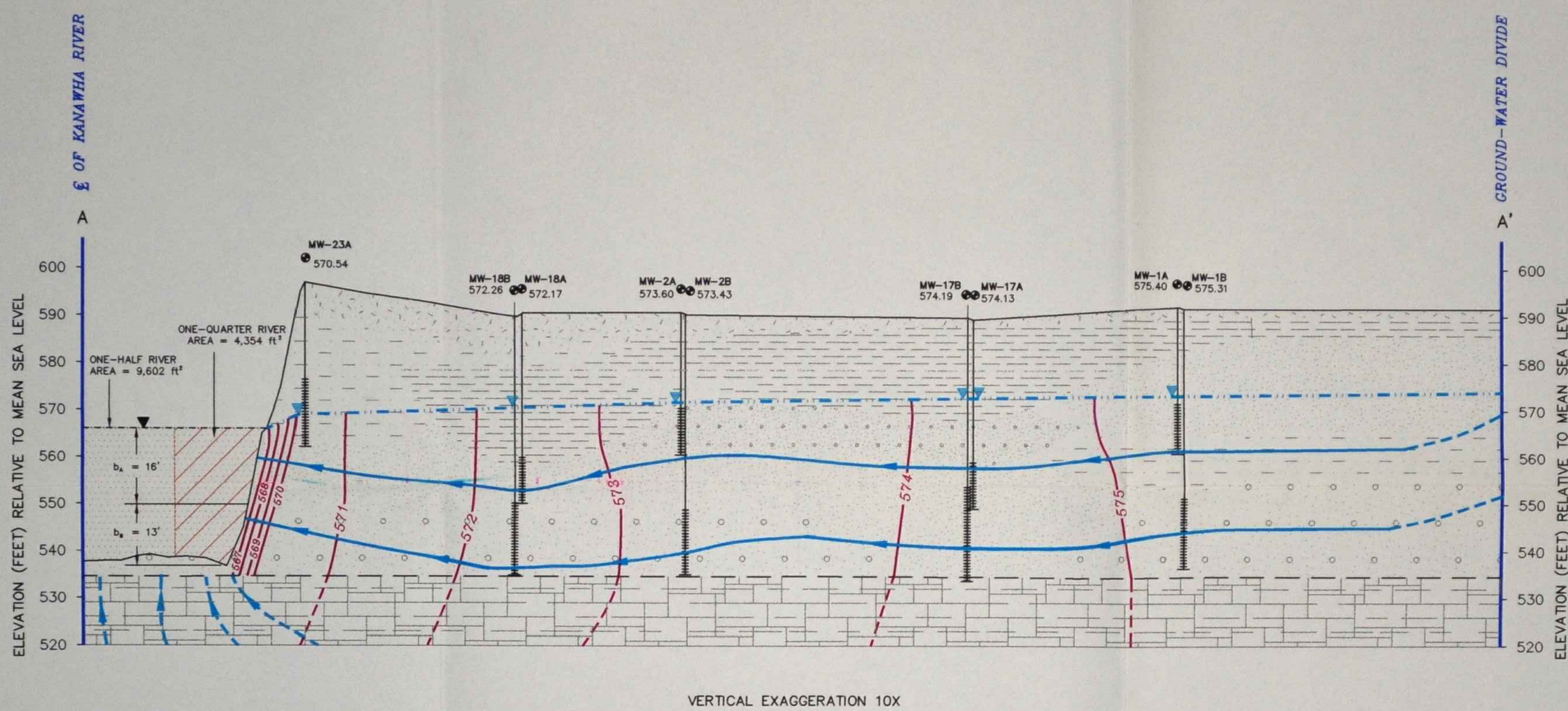
NITRO, WEST VIRGINIA

Prepared For:

SOLUTIA

ROUX
ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: W.B.S.	Date: 01/07/99	Figure
Prepared by: J.S.G.	Scale: SHOWN	2
Project Mgr: P.J.P.	Revision:	
Proj No: 06619J08	File No: 06619141	



VERTICAL EXAGGERATION 10X

LEGEND

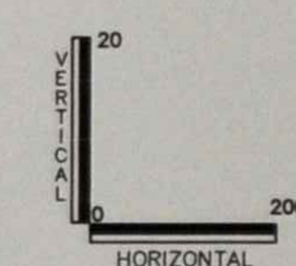
- CROSS-SECTIONAL RIVER AREA
- MW-6A — MONITORING WELL LOCATION AND IDENTIFICATION
- 566.74 — GROUND-WATER ELEVATION (FT)
- WELL CASING
- WELL SCREEN
- BOTTOM OF WELL
- WATER TABLE SURFACE
- SURFACE WATER ELEVATION
- GROUND-WATER FLOW DIRECTION (DASHED WHERE INFERRED)
- 567 — POTENTIOMETRIC GROUND-WATER CONTOUR (DASHED WHERE INFERRED)

NOTES :

1. GROUND-WATER ELEVATION MEASURED ON SEPTEMBER 20, 1994.
2. KANAWHA RIVER CROSS-SECTION INFORMATION WAS GENERATED FROM THE KANAWHA RIVER SURVEY OF 1929-1930 FROM PLATES 38 AND 39 DATED JANUARY 15, 1931.
3. REFER TO PLATE 1 FOR LOCATION OF CROSS-SECTION.
4. GROUND SURFACE TOPOGRAPHY BASED UPON SURVEYED WELL ELEVATIONS.

PREDOMINANT SOIL TYPE LEGEND

- FILL CONTAINING SAND, SILT, AND CLAY
- SILT AND CLAY
- SILT AND SAND
- FINE TO MEDIUM SAND
- MEDIUM TO COARSE SAND
- SILTSTONE BEDROCK



Title:

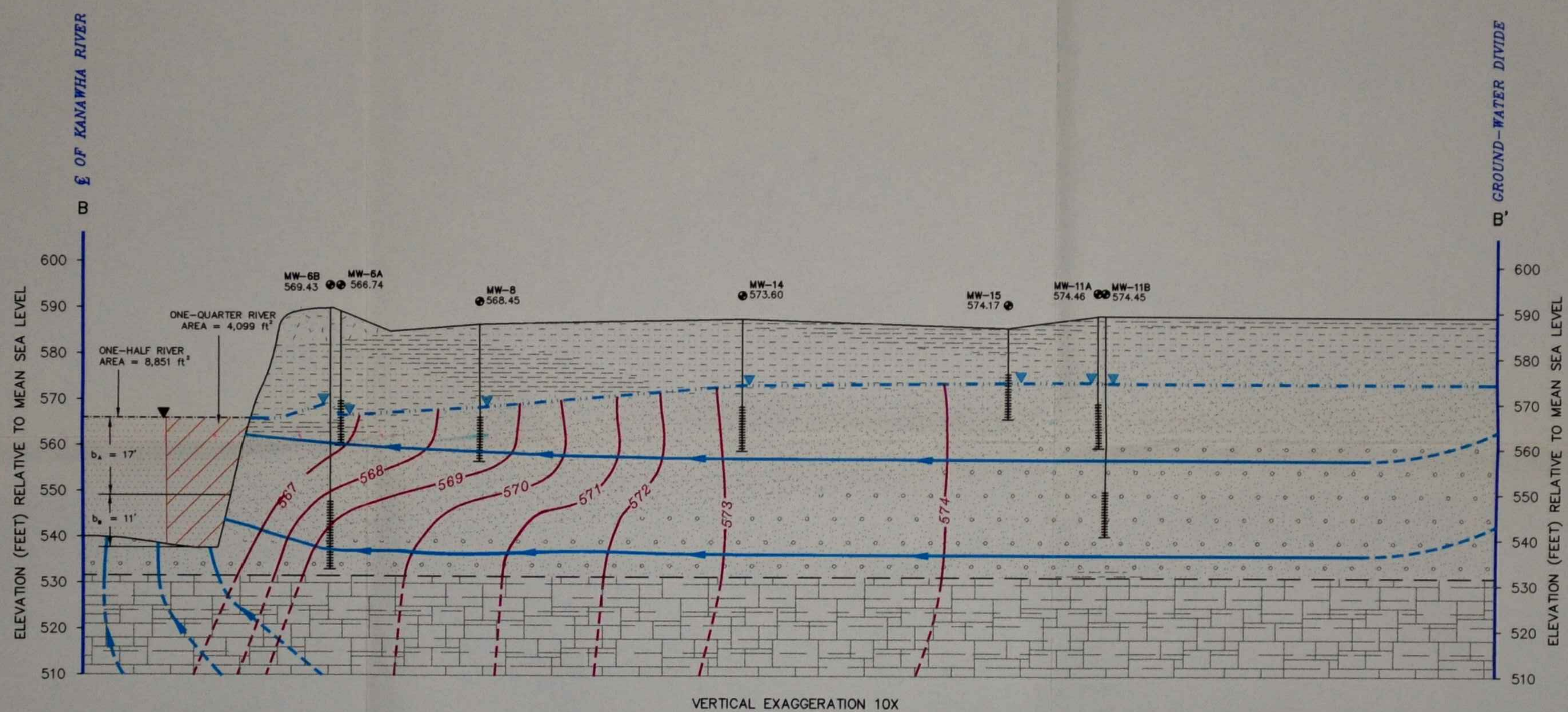
GROUND-WATER FLOW REPRESENTATION
CROSS-SECTION A - A'
TCE HOT SPOT AREA

NITRO, WEST VIRGINIA

Prepared For: SOLUTIA

ROUX
ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: J.S.G.	Date: 01/07/98	Figure
Prepared by: J.S.G.	Scale: SHOWN	3
Project Mgr: P.J.P.	Revision:	
Proj No: 06619J08	File No: 06619143	



LEGEND

- CROSS-SECTIONAL RIVER AREA
- MW-6A — MONITORING WELL LOCATION AND IDENTIFICATION
- 566.74 — GROUND-WATER ELEVATION (FT)
- WELL CASING
- WELL SCREEN
- BOTTOM OF WELL
- WATER TABLE SURFACE
- SURFACE WATER ELEVATION
- GROUND-WATER FLOW DIRECTION (DASHED WHERE INFERRED)
- 567 — POTENTIOMETRIC GROUND-WATER CONTOUR (DASHED WHERE INFERRED)

NOTES

1. GROUND-WATER ELEVATION MEASURED ON SEPTEMBER 20, 1994.
2. KANAWHA RIVER CROSS-SECTION INFORMATION WAS GENERATED FROM THE KANAWHA RIVER SURVEY OF 1929-1930 FROM PLATES 38 AND 39 DATED JANUARY 15, 1931.
3. REFER TO PLATE 1 FOR LOCATION OF CROSS-SECTION.
4. GROUND SURFACE TOPOGRAPHY BASED UPON SURVEYED WELL ELEVATIONS.

PREDOMINANT SOIL TYPE LEGEND

- FILL CONTAINING SAND, SILT, AND CLAY
- SILT AND CLAY
- SILT AND SAND
- FINE TO MEDIUM SAND
- MEDIUM TO COARSE SAND
- SILTSTONE BEDROCK

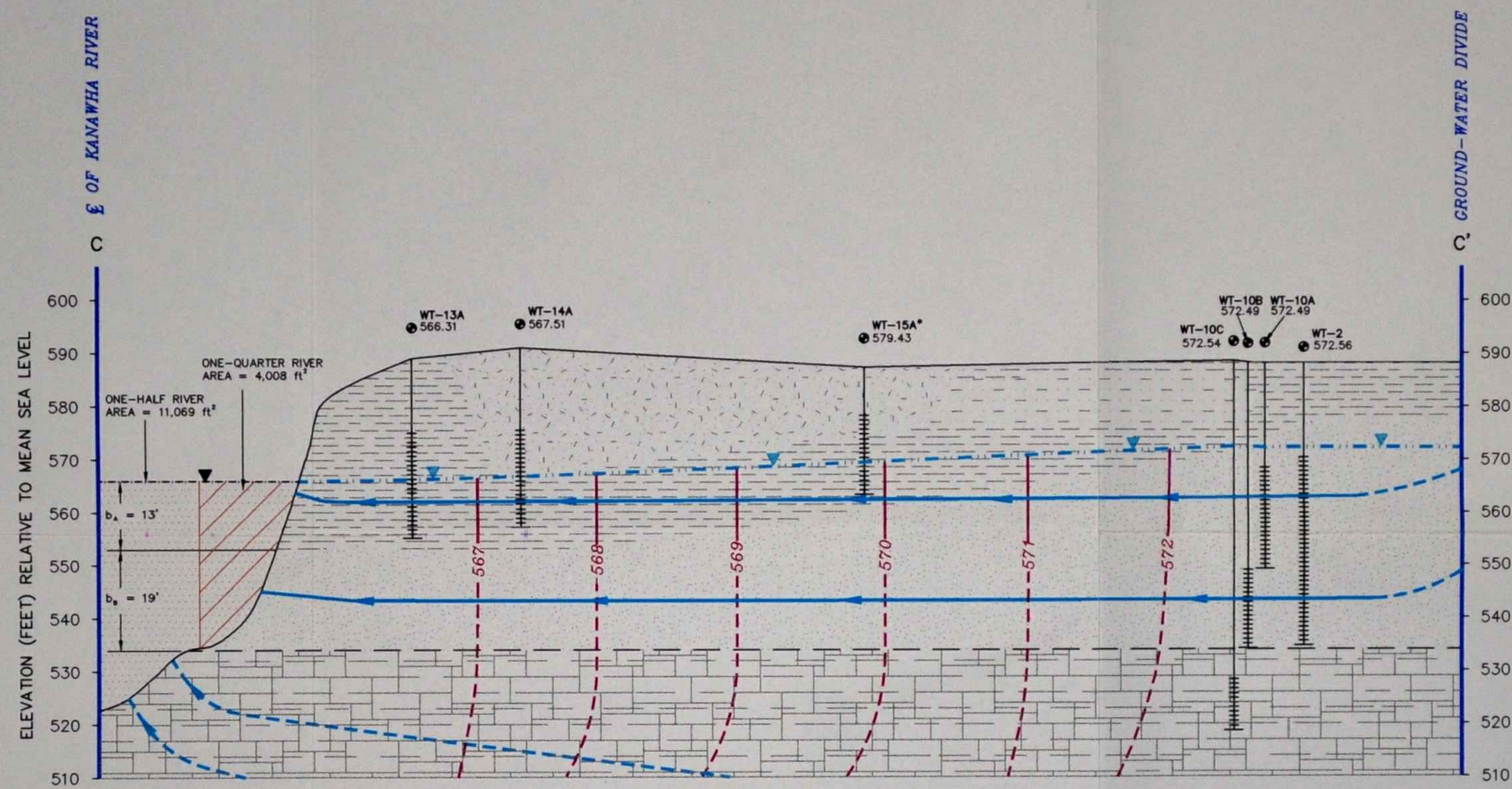
VERTICAL 0 20
HORIZONTAL 0 200

Title:
GROUND-WATER FLOW REPRESENTATION CROSS SECTION B - B' PAST DISPOSAL AREA
NITRO, WEST VIRGINIA

Prepared For: SOLUTIA

ROUX
ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: W.B.S.	Date: 01/07/98	Figure 4
Prepared by: J.S.G.	Scale: SHOWN	
Project Mgr: P.J.P.	Revision:	
Proj No: 06619J08	File No: 06619062	



VERTICAL EXAGGERATION 10X

LEGEND

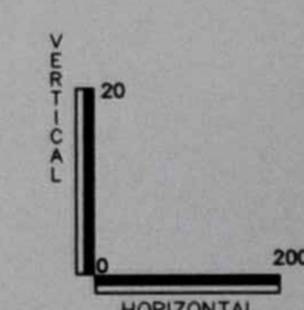
	CROSS-SECTIONAL RIVER AREA
MT-13A	MONITORING WELL LOCATION AND IDENTIFICATION
566.31	GROUND-WATER ELEVATION (FT)
*	ANAMOLOUS WATER-LEVEL ELEVATION DUE TO PERCHED WATER CAUSED BY UNDERLYING LOCALIZED DENSE CLAY (NOT USED FOR PLOTTING)
	WELL CASING
	WELL SCREEN
	BOTTOM OF WELL
	WATER TABLE SURFACE
	SURFACE WATER ELEVATION
	GROUND-WATER FLOW DIRECTION (DASHED WHERE INFERRED)
567	POTENTIOMETRIC GROUND-WATER CONTOUR (DASHED WHERE INFERRED)

NOTES ·

1. GROUND-WATER ELEVATION MEASURED ON 9/20/94.
2. KANAWHA RIVER CROSS-SECTION INFORMATION WAS GENERATED FROM THE KANAWHA RIVER SURVEY OF 1929-1930 FROM PLATES 38 AND 39 DATED JANUARY 15, 1931.
3. REFER TO PLATE 1 FOR LOCATION OF CROSS SECTION.
4. GROUND SURFACE TOPOGRAPHY BASED UPON SURVEYED WELL ELEVATIONS.

PREDOMINANT SOIL TYPE LEGEND

- FILL CONTAINING SAND, SILT, AND CLAY
- SILT AND CLAY
- SILT AND SAND
- FINE TO MEDIUM SAND
- MEDIUM TO COARSE SAND
- SILTSTONE BEDROCK



Title:

GROUND-WATER FLOW REPRESENTATION
CROSS-SECTION C - C'
NITRO DUMP AREA
NITRO, WEST VIRGINIA

Prepared For: SOLUTIA

ROUX
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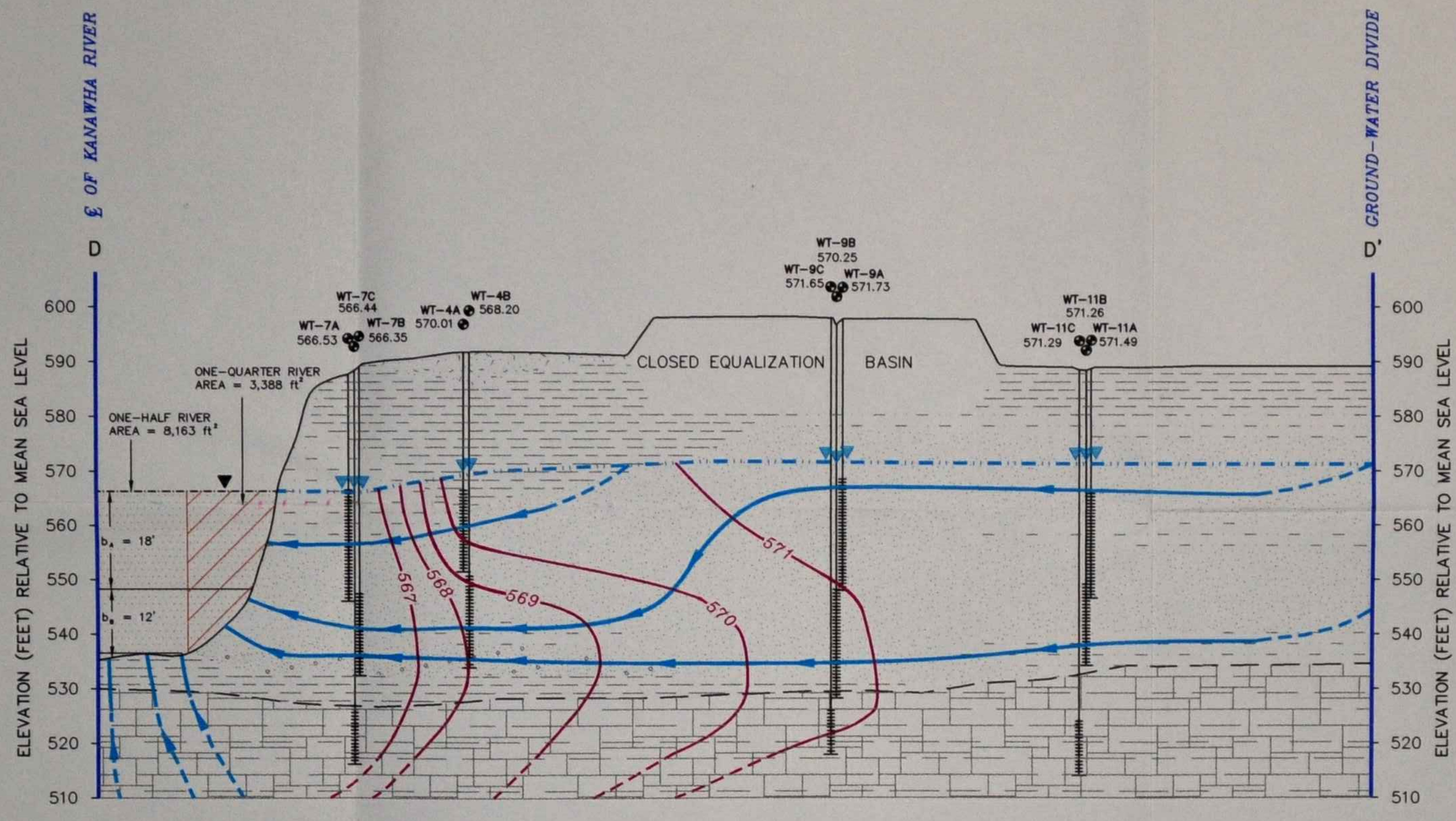
Environmental Consulting & Management

Compiled by: J.S.G.	Date: 01/04/98	Figure
Prepared by: J.S.G.	Scale: SHOWN	5
Project Mgr: P.J.P.	Revision:	
Proj No: 06619J08	File No: 06619060	



LEGEND

CROSS-SECTIONAL RIVER AREA

MT-4A — MONITORING WELL LOCATION AND IDENTIFICATION

570.01 — GROUND-WATER ELEVATION (FT)

WELL CASING

WELL SCREEN

BOTTOM OF WELL

WATER TABLE SURFACE

SURFACE WATER ELEVATION

GROUND-WATER FLOW DIRECTION (DASHED WHERE INFERRED)

567 — POTENTIOMETRIC GROUND-WATER CONTOUR (DASHED WHERE INFERRED)

NOTES

1. GROUND-WATER ELEVATION MEASURED ON SEPTEMBER 20, 1994.
2. KANAWHA RIVER CROSS-SECTION INFORMATION WAS GENERATED FROM THE KANAWHA RIVER SURVEY OF 1929-1930 FROM PLATES 38 AND 39 DATED JANUARY 15, 1931.
3. REFER TO PLATE 1 FOR LOCATION OF CROSS-SECTION.
4. GROUND SURFACE TOPOGRAPHY BASED UPON SURVEYED WELL ELEVATIONS.

PREDOMINANT SOIL TYPE LEGEND

FILL CONTAINING SAND, SILT, AND CLAY

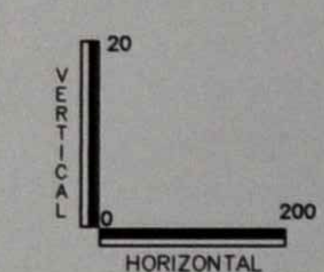
FINE TO MEDIUM SAND

SILT AND CLAY

MEDIUM TO COARSE SAND

SILT AND SAND

SILTSTONE BEDROCK



Title:

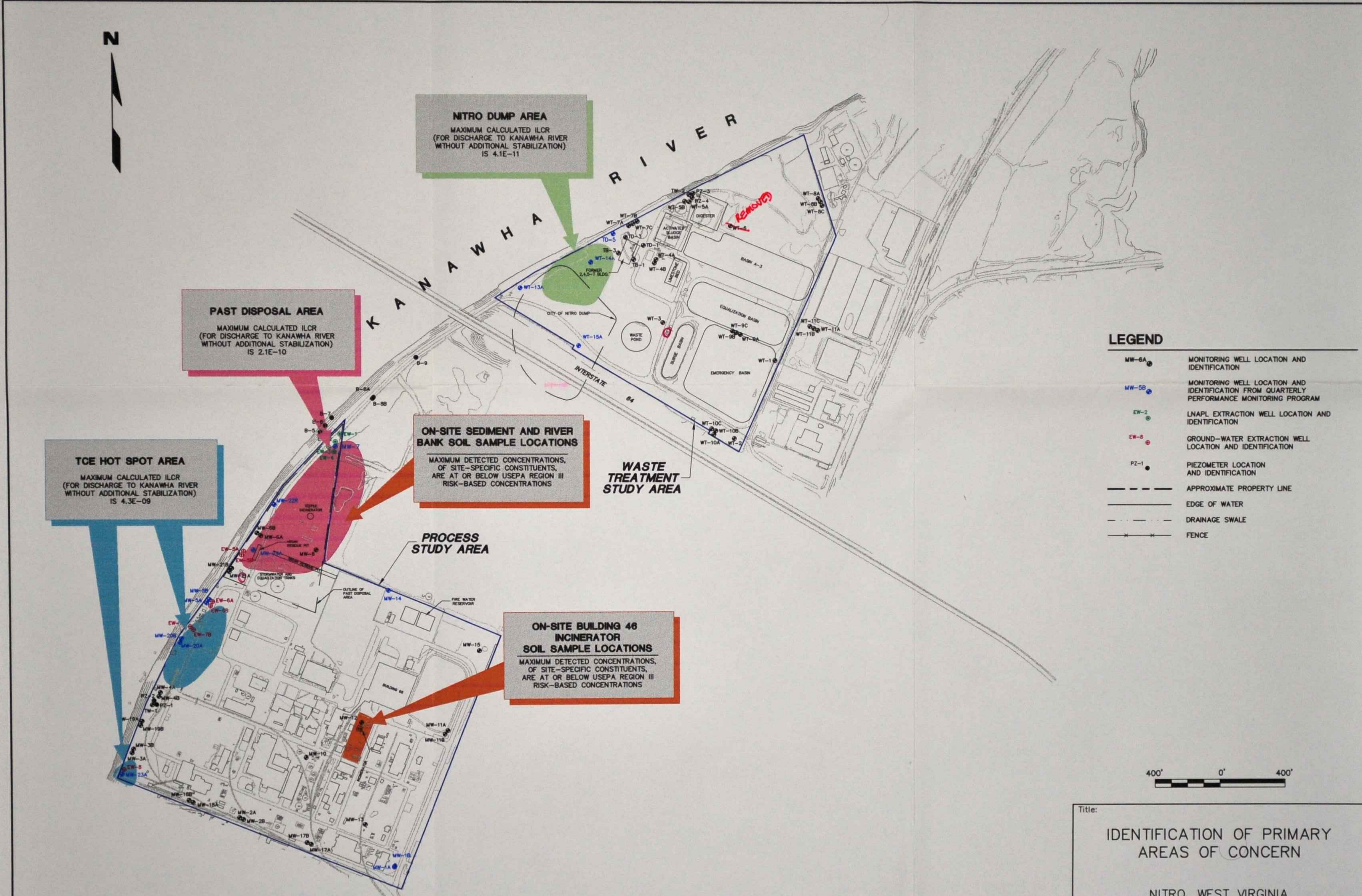
GROUND-WATER FLOW REPRESENTATION
CROSS SECTION D – D'
NORTHERN WASTE TREATMENT AREA

NITRO, WEST VIRGINIA

Prepared For: SOLUTIA

ROUX
ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: J.S.G.	Date: 01/04/98	Figure
Prepared by: J.S.G.	Scale: SHOWN	6
Project Mgr: P.J.P.	Revision:	
Proj No: 06619J08	File No: 06619063	



Title:

IDENTIFICATION OF PRIMARY AREAS OF CONCERN

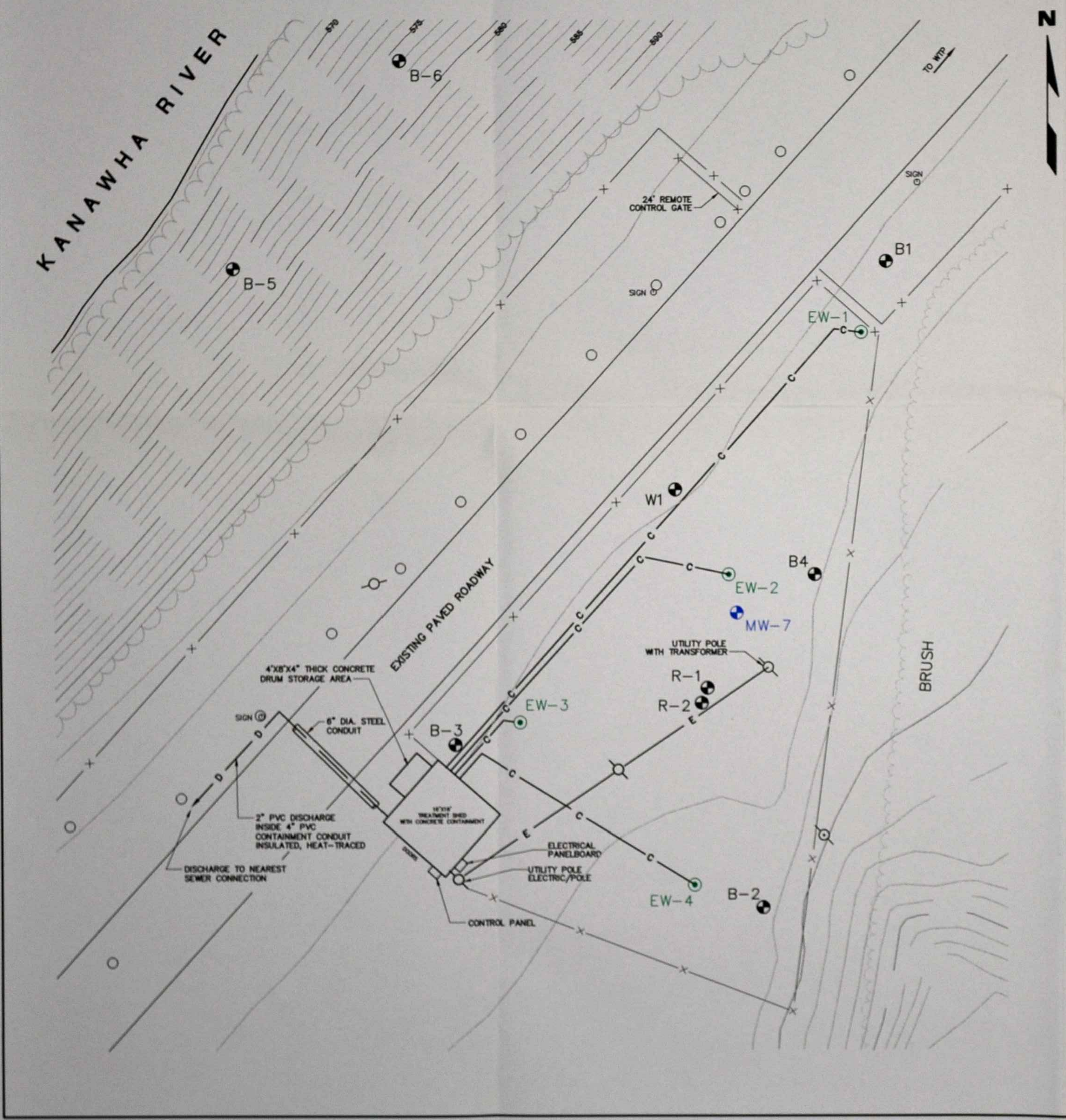
NITRO, WEST VIRGINIA

Prepared For: SOLUTIA

ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: W.B.S.	Date: 01/07/99	Figure
Prepared by: J.S.G.	Scale: SHOWN	7
Project Mgr: P.J.P.	Revision:	
Proj No: 06619J08	File No: 06619145	

N
LEGEND
MONITORING WELL LOCATION AND IDENTIFICATION
MONITORING WELL LOCATION AND IDENTIFICATION FROM QUARTERLY PERFORMANCE MONITORING PROGRAM
LNAPL EXTRACTION WELL LOCATION AND IDENTIFICATION
GROUND-WATER EXTRACTION WELL LOCATION AND IDENTIFICATION
PIEZOMETER LOCATION AND IDENTIFICATION
EDGE OF WATER
FENCE
BOUNDARIES OF STUDY AREAS
PROPOSED NEW PROCESS SEWER-LINE LOCATION
COMPLETED SOIL STABILIZATION AREA FOR FORMER SURFACE IMPOUNDMENTS/DISPOSAL AREAS
RECENTLY COMPLETED SOIL STABILIZATION AREA FOR REMAINING SURFACE IMPOUNDMENTS
LNAPL STABILIZATION AREA FOR RECOVERY OF OBSERVED KEROSENE PRODUCT
LIMITED "HOT SPOT" GROUND WATER EXTRACTION AND TREATMENT AREAS FOR REDUCTION OF HIGHEST OBSERVED DISSOLVED-PHASE CONSTITUENTS
"HOT SPOT" GROUND WATER IN-SITU TREATMENT AREA FOR AUGMENTATION OF BIODEGRADABLE DISSOLVED-PHASE CONSTITUENTS
PROCESS SEWER STABILIZATION AREA FOR MINIMIZATION OF POTENTIAL TO RELEASE PROCESS WASTES TO ENVIRONMENT
INTRINSIC REMEDIATION AND GROUND WATER MONITORING AREA FOR "NON-HOT-SPOT" GROUND-WATER AREAS
REFERENCE
1.) TOPOGRAPHIC MAP PREPARED BY TERRADON CORPORATION DATED 2/17/95.
KANAWHA RIVER
NORTHERN WASTE TREATMENT AREA
NITRO DUMP AREA
PRIMARY GROUND-WATER AREA OF CONCERN NO. 3
PAST DISPOSAL AREA
OBSERVED LNAPL AREA
PRIMARY GROUND-WATER AREA OF CONCERN NO. 1
PROCESS STUDY AREA
TCE HOT SPOT AREA
PRIMARY GROUND-WATER AREA OF CONCERN NO. 2
WASTE TREATMENT STUDY AREA
EQUALIZATION BASIN
EMERGENCY BASIN
WASTE POND
DIGESTER
INTERSTATE 64
FORMER EXTENT OF NITRO DUMP AREA
BUILDING 44
FIRE WATER RESERVOIR
400' 0' 400'
Title:
SUMMARY OF SELECTED STABILIZATION MEASURES
NITRO, WEST VIRGINIA
Prepared For:
SOLUTIA
ROUX
ROUX ASSOCIATES INC
Environmental Consulting & Management
Compiled by: W.B.S.
Prepared by: J.S.G.
Project Mgr: P.J.P.
Proj No: 06619J08
Date: 01/07/99
Scale: SHOWN
Revision:
File No: 06619146
Figure
8



LEGEND

B-5	MONITORING WELL LOCATION AND IDENTIFICATION
EW-2	LNAPL EXTRACTION WELL LOCATION AND IDENTIFICATION
MW-7	MONITORING WELL LOCATION AND IDENTIFICATION FROM QUARTERLY PERFORMANCE MONITORING PROGRAM
	1 FOOT CONTOUR ELEVATION
585	5 FOOT CONTOUR ELEVATION
	EXISTING FENCE
—E——E—	OVERHEAD INCOMING ELECTRICAL AND PHONE SERVICE
—C——C—	ABOVEGROUND 4" DIAMETER PVC SCH. 80 CARRIER CONDUIT FOR AIR SUPPLY TO, AND WATER DISCHARGE FROM, WELL PUMPS
—D——D—	2" DIAMETER PVC SCH. 80 DISCHARGE LINE INSIDE 4" PVC CONTAINMENT CONDUIT TO SEWER
	EXISTING POLE
	EXISTING TREES
	EXISTING UTILITY POLE

NOTE

1.) DASHED CONTOURS EXHIBIT HEAVY FOLIAGE

REFERENCE

1.) TOPOGRAPHIC MAP PREPARED BY TERRADON CORPORATION DATED 2/17/95.

15' 0' 15'

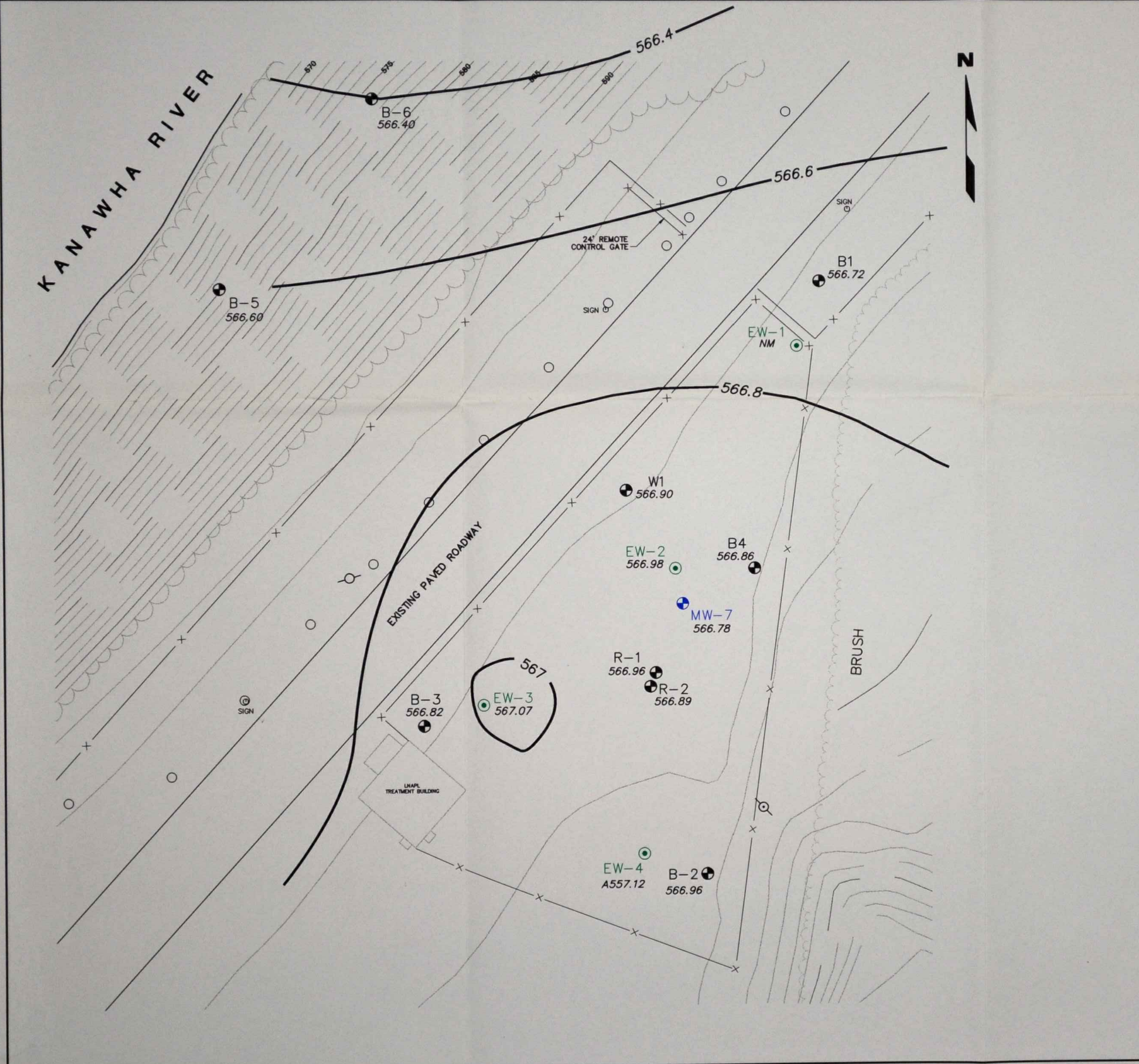
Title:

SITE PLAN SHOWING LNAPL TREATMENT SYSTEM

NITRO, WEST VIRGINIA

Prepared For: SOLUTIA

ROUX ASSOCIATES INC Environmental Consulting & Management	Compiled by: W.S.	Date: 01/21/99	Figure
	Prepared by: J.S.G.	Scale: SHOWN	9
	Project Mgr: P.J.P.	Revision:	
	Proj No: 06619J	File No: 06619138	



LEGEND

B-5	MONITORING WELL LOCATION AND IDENTIFICATION
EW-2	LNAPL EXTRACTION WELL LOCATION AND IDENTIFICATION
MW-7	MONITORING WELL LOCATION AND IDENTIFICATION FROM QUARTERLY PERFORMANCE MONITORING PROGRAM
566.6	LINE OF EQUAL WATER-LEVEL ELEVATION (FEET)
566.72	WATER-LEVEL ELEVATION (FEET)
A557.52	ANOMALOUS WATER-LEVEL ELEVATION (FEET) (NOT USED IN CONTOURING)
	1 FOOT CONTOUR ELEVATION
	EXISTING POLE
	EXISTING TREES
	EXISTING FENCE

NOTE

1.) DASHED CONTOURS EXHIBIT HEAVY FOLIAGE

REFERENCE

1.) TOPOGRAPHIC MAP PREPARED BY TERRADON CORPORATION DATED 2/17/95.

15' 0' 15'

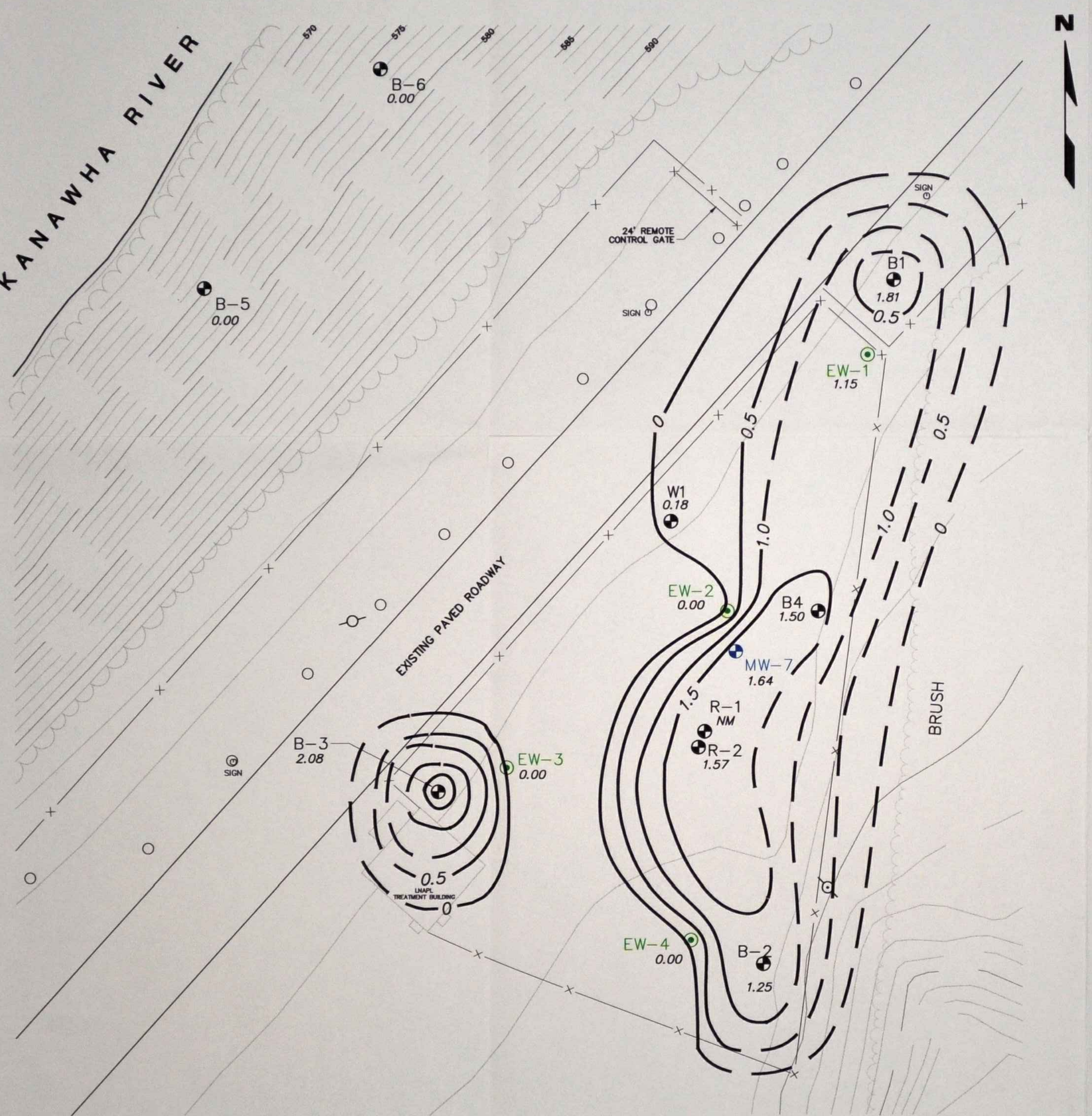
Title:

PAST DISPOSAL AREA
GROUND-WATER CONTOUR MAP
DECEMBER 4, 1998

NITRO, WEST VIRGINIA

Prepared For: SOLUTIA

ROUX ROUX ASSOCIATES INC Environmental Consulting & Management	Compiled by: W.B.S.	Date: 01/21/99	Figure
	Prepared by: M.M.H.	Scale: SHOWN	10
	Project Mgr: P.J.P.	Revision:	
	Proj No: 06619J	File No: 06619140	



LEGEND

B-5	MONITORING WELL LOCATION AND IDENTIFICATION
EW-2	LNAPL EXTRACTION WELL LOCATION AND IDENTIFICATION
MW-7	MONITORING WELL LOCATION AND IDENTIFICATION FROM QUARTERLY PERFORMANCE MONITORING PROGRAM
—1.0—	LINE OF EQUAL APPARENT LNAPL THICKNESS (FEET) (DASHED WHERE INFERRED)
0.18	APPARENT LNAPL THICKNESS (FEET)
NM	NOT MEASURED
	1 FOOT CONTOUR ELEVATION
	EXISTING POLE
	EXISTING TREES
×——×	EXISTING FENCE

NOTE

1.) DASHED CONTOURS EXHIBIT HEAVY FOLIAGE

REFERENCE

1.) TOPOGRAPHIC MAP PREPARED BY TERRADON CORPORATION DATED 2/17/95.

Title:

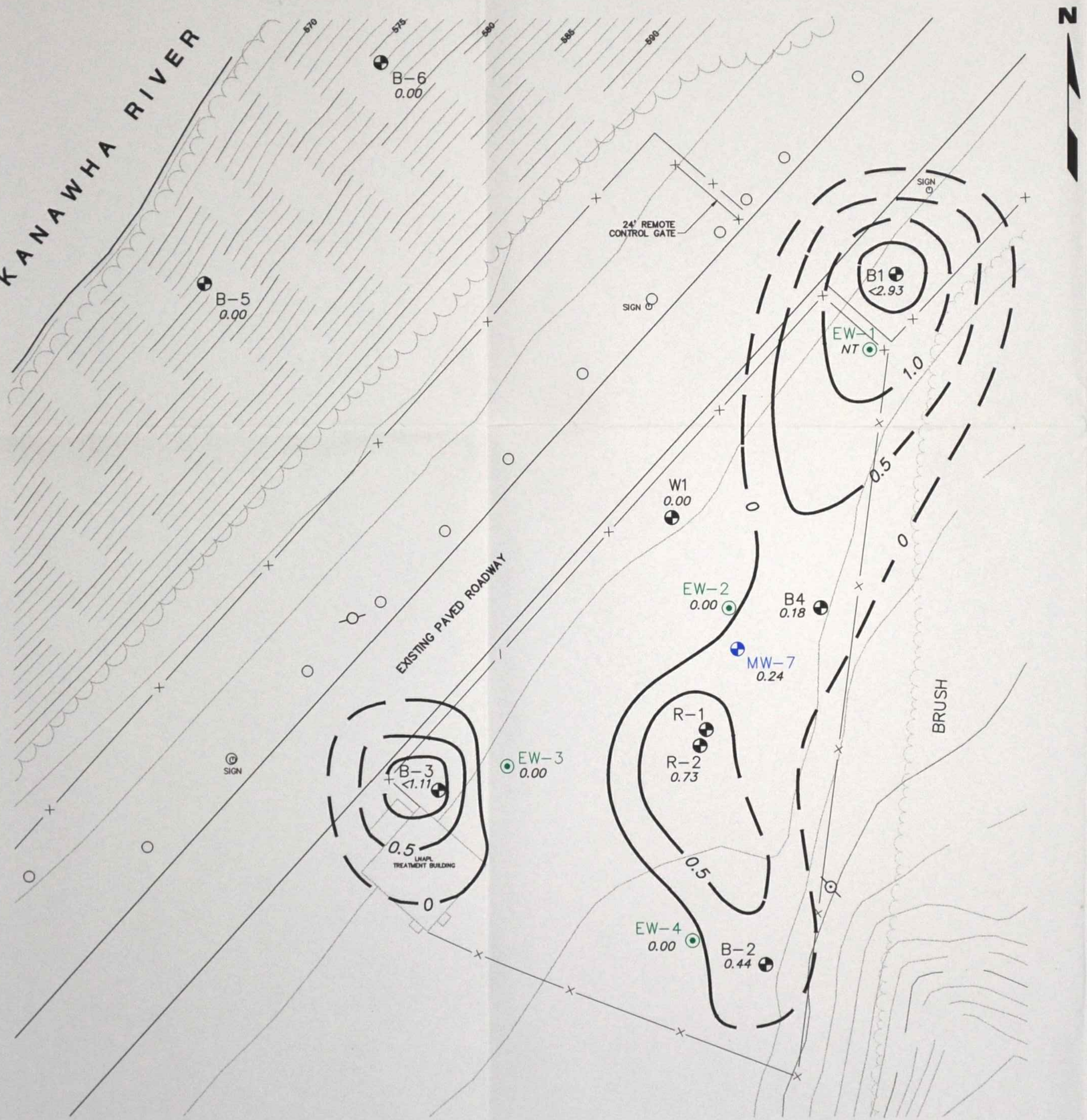
PAST DISPOSAL AREA
APPARENT LNAPL THICKNESS MAP
DECEMBER 1998

NITRO, WEST VIRGINIA

Prepared For: SOLUTIA

ROUX
ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: W.B.S.	Date: 01/21/99	Figure
Prepared by: M.M.H.	Scale: SHOWN	11
Project Mgr: P.J.P.	Revision:	
Proj No: 06619J	File No: 06619147	



LEGEND

B-5	MONITORING WELL LOCATION AND IDENTIFICATION
EW-2	LNAPL EXTRACTION WELL LOCATION AND IDENTIFICATION
MW-7	MONITORING WELL LOCATION AND IDENTIFICATION FROM QUARTERLY PERFORMANCE MONITORING PROGRAM
1.0	LINE OF EQUAL LNAPL THICKNESS (FEET)
0.18	LNAPL THICKNESS (FEET)
NT	NOT TESTED
	1 FOOT CONTOUR ELEVATION
	EXISTING POLE
	EXISTING TREES
	EXISTING FENCE

NOTE

1.) DASHED CONTOURS EXHIBIT HEAVY FOLIAGE

REFERENCE

1.) TOPOGRAPHIC MAP PREPARED BY TERRADON CORPORATION DATED 2/17/95.

15' 0' 15'

Title:

PAST DISPOSAL AREA
ACTUAL LNAPL THICKNESS MAP
DECEMBER 1998

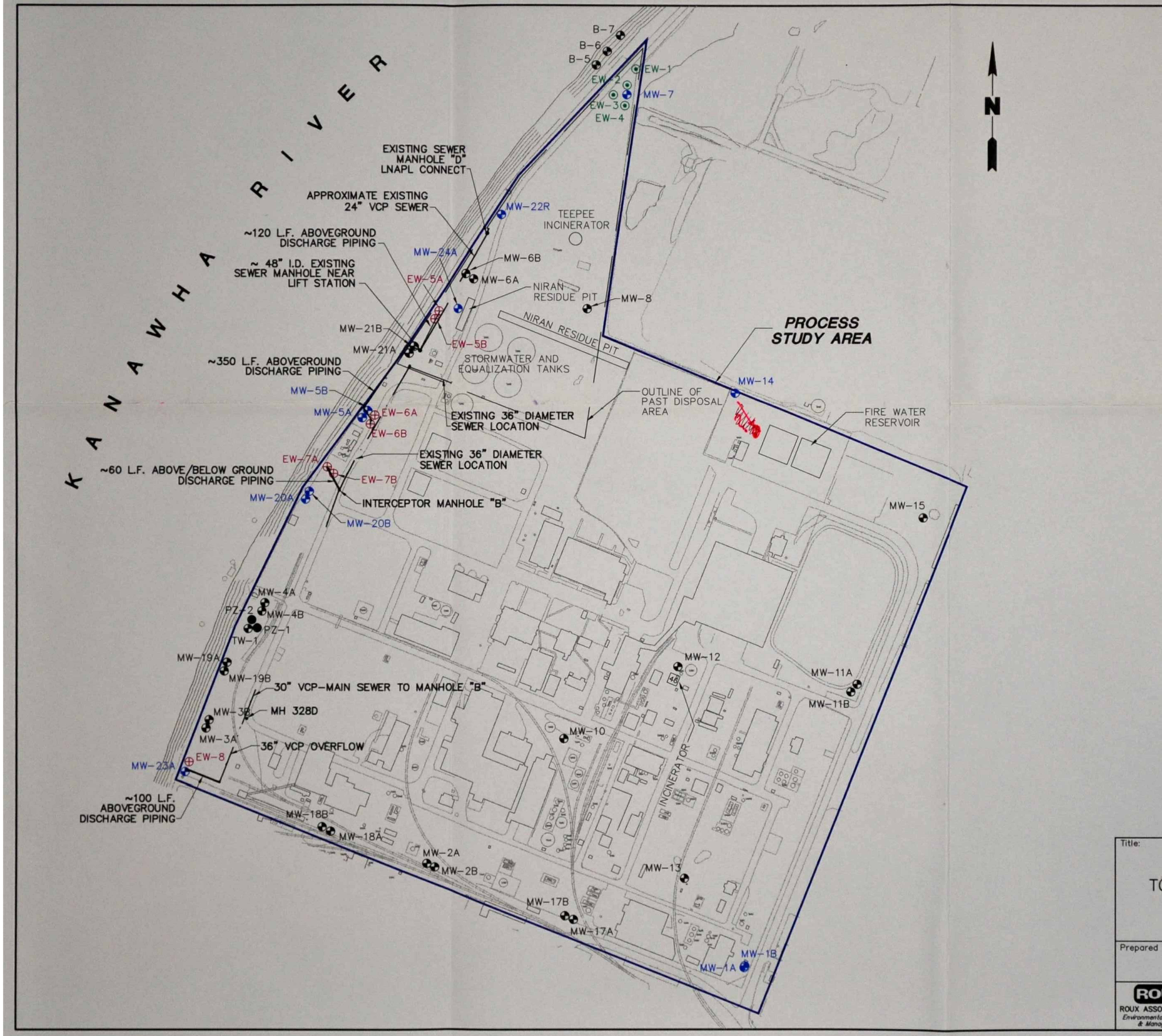
NITRO, WEST VIRGINIA

Prepared For:

SOLUTIA

ROUX
ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: W.B.S.	Date: 01/09/99	Figure
Prepared by: M.M.H.	Scale: SHOWN	12
Project Mgr: P.J.P.	Revision:	
Proj No: 06619J	File No: 06619148	



LEGEND

MW-6A	MONITORING WELL LOCATION AND IDENTIFICATION
MW-5B	MONITORING WELL LOCATION AND IDENTIFICATION FROM QUARTERLY PERFORMANCE MONITORING PROGRAM
EW-2	LNAPL EXTRACTION WELL LOCATION AND IDENTIFICATION
EW-8	GROUND-WATER EXTRACTION WELL LOCATION AND IDENTIFICATION
PZ-1	PIEZOMETER LOCATION AND IDENTIFICATION
	EDGE OF WATER
	DRAINAGE SWALE
	GROUND-WATER DIVIDE
	FENCE
	FORMER EXTENT OF NITRO DUMP AREA

REFERENCE

1.) TOPOGRAPHIC MAP PREPARED BY TERRADON CORPORATION DATED 2/17/95.

2.) PLANT SEWERS AREAS P-SOUTH, T-SOUTH, & Q PREPARED BY MONSANTO CHEMICAL COMPANY DATED 3/24/92.

200' 0' 200'

Title:

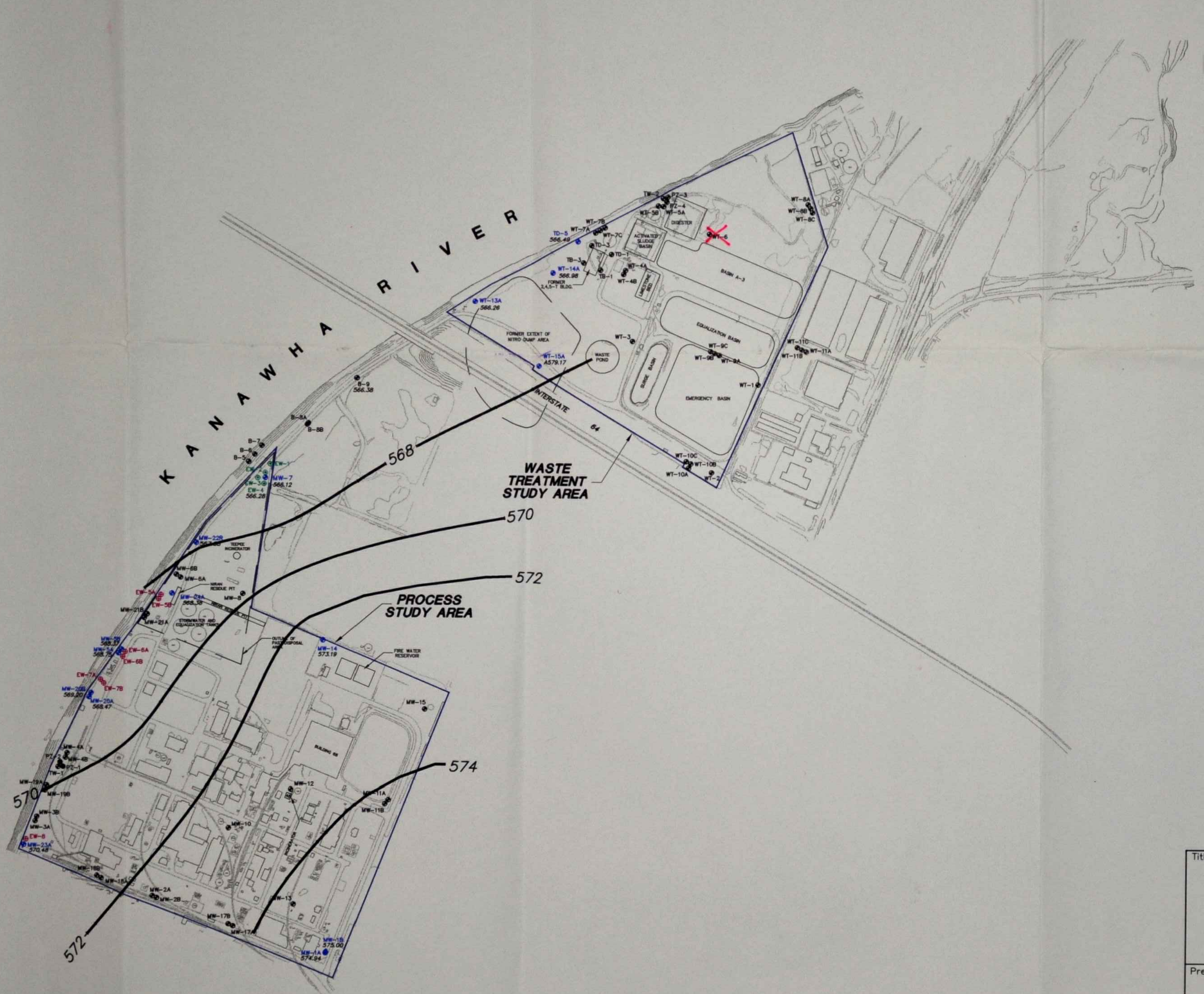
SITE PLAN SHOWING TCE HOT SPOT REMEDIATION SYSTEM

NITRO, WEST VIRGINIA

Prepared For: SOLUTIA

ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: W.B.S.	Date: 01/07/99	Figure	
Prepared by: J.S.G.	Scale: SHOWN	13	
Project Mgr: P.J.P.	Revision:		
Proj No: 06619J08	File No: 06619134		



LEGEND

- MW-6A — MONITORING WELL LOCATION AND IDENTIFICATION
- MW-5B — MONITORING WELL LOCATION AND IDENTIFICATION FROM QUARTERLY PERFORMANCE MONITORING PROGRAM
- EW-2 — LNAPL EXTRACTION WELL LOCATION AND IDENTIFICATION
- EW-8 — GROUND-WATER EXTRACTION WELL LOCATION AND IDENTIFICATION
- PZ-1 — PIEZOMETER LOCATION AND IDENTIFICATION
- 572 — LINE OF EQUAL WATER-LEVEL ELEVATION (FEET)
- 570.29 — WATER-LEVEL ELEVATION (FEET)
- A557.52 — ANOMALOUS WATER-LEVEL ELEVATION (FEET) (NOT USED IN CONTOURING)
- EDGE OF WATER
- DRAINAGE SWALE
- GROUND-WATER DIVIDE
- FENCE
- FORMER EXTENT OF NITRO DUMP AREA

NOTES

1.) DASHED CONTOURS EXHIBIT HEAVY FOLIAGE.

2.) THIS CONTOUR MAP HAS BEEN PREPARED USING GAUGING DATA FROM SELECT AREAS ACROSS THE SITE THAT ARE PART OF THE QUARTERLY SAMPLING PROGRAM. FUTURE CONTOUR MAPS WILL INCORPORATE DATA FROM ALL SITE WELLS.

REFERENCE

1.) TOPOGRAPHIC MAP PREPARED BY TERRADON CORPORATION DATED 2/17/95.

400' 0' 400'

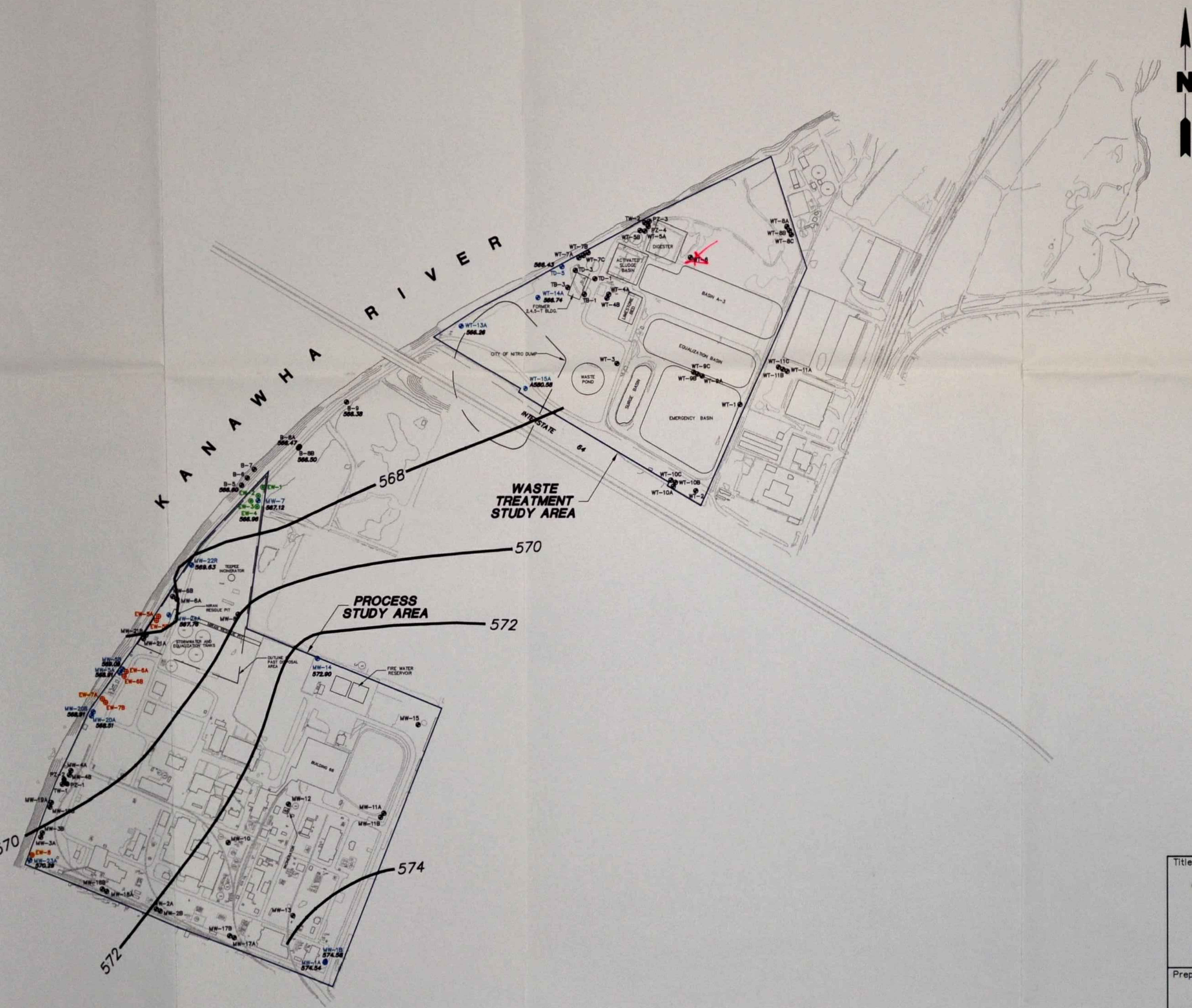
Title:

GROUND WATER CONTOUR MAP
ALL WELLS PUMPING
NOVEMBER 20, 1997

NITRO, WEST VIRGINIA

Prepared For: SOLUTIA

ROUX ASSOCIATES INC Environmental Consulting & Management	Compiled by: W.B.S.	Date: 01/07/99	Figure
	Prepared by: J.S.G.	Scale: SHOWN	14
	Project Mgr: P.J.P.	Revision:	
	Proj No: 06619J08	File No: 06619142	



LEGEND

MW-6A	MONITORING WELL LOCATION AND IDENTIFICATION
MW-5B	MONITORING WELL LOCATION AND IDENTIFICATION FROM QUARTERLY PERFORMANCE MONITORING PROGRAM
EW-2	LNAPL EXTRACTION WELL LOCATION AND IDENTIFICATION
EW-8	GROUND-WATER EXTRACTION WELL LOCATION AND IDENTIFICATION
PZ-1	PIEZOMETER LOCATION AND IDENTIFICATION
572	LINE OF EQUAL WATER-LEVEL ELEVATION (FEET)
570.29	WATER-LEVEL ELEVATION (FEET)
A557.52	ANOMALOUS WATER-LEVEL ELEVATION (FEET) (NOT USED IN CONTOURING)
	EDGE OF WATER
	DRAINAGE SWALE
	GROUND-WATER DIVIDE
	FENCE
	FORMER EXTENT OF NITRO DUMP AREA

NOTES

1.) DASHED CONTOURS EXHIBIT HEAVY FOLIAGE.

2.) THIS CONTOUR MAP HAS BEEN PREPARED USING GAUGING DATA FROM SELECT AREAS ACROSS THE SITE THAT ARE PART OF THE QUARTERLY SAMPLING PROGRAM. FUTURE CONTOUR MAPS WILL INCORPORATE DATA FROM ALL SITE WELLS.

REFERENCE

1.) TOPOGRAPHIC MAP PREPARED BY TERRADON CORPORATION DATED 2/17/95.

400' 0' 400'

Title:

GROUND WATER CONTOUR MAP
STATIC CONDITION
DECEMBER 4, 1998

NITRO, WEST VIRGINIA

Prepared For:

SOLUTIA

ROUX ASSOCIATES INC Environmental Consulting & Management	Compiled by: W.B.S.	Date: 01/07/99	Figure
	Prepared by: J.S.G.	Scale: SHOWN	15
	Project Mgr: P.J.P.	Revision:	
	Proj No: 06619J08	File No: 06619136	


KANAWHA RIVER
N
WT-7C
WT-7A
WT-7B
TD-5
TD-3
BALL VALVE
14' x 14' CONCRETE PAD
OXYGEN SERVICE TWO STAGE REGULATOR
TD-1
TB-3
TRENCH 1 FOOT DEEP
TB-1
WT-4A
WT-4B
AS3 (s/m/d)
WT-14A
AS4 (s/ms/md/d)
WP (s/d)
EP (s/d)
AS1 (s/m/d)
CHAIN LINK FENCE
WT-13A
WT-3
WT-15A
TANK
PAD
BRUSH
LEGEND
MW-5B MONITORING WELL LOCATION AND IDENTIFICATION IDENTIFICATION
WT-13A QUARTERLY PERFORMANCE MONITORING PROGRAM MONITORING WELL LOCATION AND IDENTIFICATION
AS4 (s/ms/md/d) EXISTING OXYGEN INJECTION POINT GROUP LOCATION AND IDENTIFICATION (SHALLOW/MIDDLE-SHALLOW/MIDDLE-DEEP/DEEP)
1 FOOT CONTOUR ELEVATION
5 FOOT CONTOUR ELEVATION
FENCE
WP (s/d) PIEZOMETER PAIR (SHALLOW/DEEP) LOCATION AND IDENTIFICATION
NOTE
1.) DASHED CONTOURS EXHIBIT HEAVY FOLIAGE
REFERENCE
1.) TOPOGRAPHIC MAP PREPARED BY TERRADON CORPORATION DATED 2/17/95.
60' 0' 60'
Title:
SITE PLAN SHOWING CITY OF NITRO DUMP AREA
NITRO, WEST VIRGINIA
Prepared For:
SOLUTIA
ROUX
ROUX ASSOCIATES INC
Environmental Consulting & Management
Compiled by: W.S.
Prepared by: J.S.G.
Project Mgr: P.J.P.
Proj No: 06619J
Date: 01/21/98
Scale: SHOWN
Revision:
File No: 06619135
Figure
16

APPENDIX A

QUARTERLY MONITORING PROGRAM LABORATORY DATA PACKAGES AND FIELD MONITORING LOGS

3RD QUARTER 1996

DRAFT

3 Q 96
Perf. Monitoring

MONSANTO COMPANY
THE CHEMICAL GROUP
1 MONSANTO DRIVE
NITRO WV 25143

REIC JOB #: 0996-45811
SITE ID & STATE: MONSANTO - FLEXSYS PLANT
PROJECT ID: 96x150.003
CUSTODY NO.: 2767 & 2768

Prepared By:
REIC LABORATORY
PO Box 286
Beaver WV 25813

MONSANTO SAMPLE #: WT-15A
REIC SAMPLE #: 45811-1
DATE SAMPLED: 09-18-96
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.009	mg/l	8260A	0.001	09-26-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	98
toluene-d8	100
4-bromofluorobenzene	96

SEMIVOLATILE ORGANIC COMPOUNDS/ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	625	0.020	09-27-96/WP
2-chlorophenol	ND	mg/l	625	0.020	09-27-96/WP
2-nitrophenol	ND	mg/l	625	0.020	09-27-96/WP
2,4-dimethylphenol	ND	mg/l	625	0.020	09-27-96/WP
2,4-dichlorophenol	ND	mg/l	625	0.020	09-27-96/WP
4-chloro-3-methylphenol	ND	mg/l	625	0.020	09-27-96/WP
2,4,6-trichlorophenol	ND	mg/l	625	0.020	09-27-96/WP
2,4-dinitrophenol	ND	mg/l	625	0.020	09-27-96/WP
4-nitrophenol	ND	mg/l	625	0.020	09-27-96/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	625	0.020	09-27-96/WP
pentachlorophenol	ND	mg/l	625	0.020	09-27-96/WP

Surrogates	% Recovery
2-fluorophenol	34
phenol-d6	30
2,4,6-tribromophenol	112

ND - None Detected at MQL
MQL - Minimum Quantifying Level

Monsanto Company, The Chemical Group
Job #: 0996-45811

MONSANTO SAMPLE #: WT-14A   **DATE SAMPLED:** 09-19-96
REIC SAMPLE #: 45811-2   **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	1.21	mg/l	8260A	0.200	09-26-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	100
toluene-d8	101
4-bromofluorobenzene	103

SEMIVOLATILE ORGANIC COMPOUNDS/ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	0.341	mg/l	625	0.020	10-01-96/WP
2-chlorophenol	0.020	mg/l	625	0.020	10-01-96/WP
2-nitrophenol	ND	mg/l	625	0.020	10-01-96/WP
2,4-dimethylphenol	0.307	mg/l	625	0.020	10-01-96/WP
2,4-dichlorophenol	0.067	mg/l	625	0.020	10-01-96/WP
4-chloro-3-methylphenol	ND	mg/l	625	0.020	10-01-96/WP
2,4,6-trichlorophenol	0.187	mg/l	625	0.020	10-01-96/WP
2,4-dinitrophenol	ND	mg/l	625	0.020	10-01-96/WP
4-nitrophenol	ND	mg/l	625	0.020	10-01-96/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	625	0.020	10-01-96/WP
pentachlorophenol	ND	mg/l	625	0.020	10-01-96/WP

Surrogates	% Recovery
2-fluorophenol	28
phenol-d6	29
2,4,6-tribromophenol	103

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: WT-13A
REIC SAMPLE #: 45811-3

DATE SAMPLED: 09-19-96
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.013	mg/l	8260A	0.001	09-25-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	102
toluene-d8	101
4-bromofluorobenzene	101

SEMIVOLATILE ORGANIC COMPOUNDS/ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	625	0.020	09-27-96/WP
2-chlorophenol	ND	mg/l	625	0.020	09-27-96/WP
2-nitrophenol	ND	mg/l	625	0.020	09-27-96/WP
2,4-dimethylphenol	ND	mg/l	625	0.020	09-27-96/WP
2,4-dichlorophenol	ND	mg/l	625	0.020	09-27-96/WP
4-chloro-3-methylphenol	ND	mg/l	625	0.020	09-27-96/WP
2,4,6-trichlorophenol	0.122	mg/l	625	0.020	09-27-96/WP
2,4-dinitrophenol	ND	mg/l	625	0.020	09-27-96/WP
4-nitrophenol	ND	mg/l	625	0.020	09-27-96/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	625	0.020	09-27-96/WP
pentachlorophenol	ND	mg/l	625	0.020	09-27-96/WP

Surrogates	% Recovery
2-fluorophenol	27
phenol-d6	22
2,4,6-tribromophenol	95

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: TD-5
REIC SAMPLE #: 45811-4

DATE SAMPLED: 09-19-96
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	ND	mg/l	8260A	0.001	09-25-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	103
toluene-d8	102
4-bromofluorobenzene	99

SEMIVOLATILE ORGANIC COMPOUNDS/ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	625	0.020	09-27-96/WP
2-chlorophenol	ND	mg/l	625	0.020	09-27-96/WP
2-nitrophenol	ND	mg/l	625	0.020	09-27-96/WP
2,4-dimethylphenol	ND	mg/l	625	0.020	09-27-96/WP
2,4-dichlorophenol	ND	mg/l	625	0.020	09-27-96/WP
4-chloro-3-methylphenol	ND	mg/l	625	0.020	09-27-96/WP
2,4,6-trichlorophenol	ND	mg/l	625	0.020	09-27-96/WP
2,4-dinitrophenol	ND	mg/l	625	0.020	09-27-96/WP
4-nitrophenol	ND	mg/l	625	0.020	09-27-96/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	625	0.020	09-27-96/WP
pentachlorophenol	ND	mg/l	625	0.020	09-27-96/WP

Surrogates	% Recovery
2-fluorophenol	28
phenol-d6	24
2,4,6-tribromophenol	86

ND - None Detected at MQL
MQL - Minimum Quantifying Level

Monsanto Company, The Chemical Group
Job #: 0996-45811

MONSANTO SAMPLE #: MW-1A
REIC SAMPLE #: 45811-5

DATE SAMPLED: 09-20-96
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	ND	mg/l	8260A	0.001	09-25-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	99
toluene-d8	101
4-bromofluorobenzene	98

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-1B
REIC SAMPLE #: 45811-6

DATE SAMPLED: 09-20-96
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	0.033	mg/l	8260A	0.001	09-26-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	98
toluene-d8	101
4-bromofluorobenzene	98

MQL - Minimum Quantifying Level

Monsanto Company, The Chemical Group
Job #: 0996-45811

MONSANTO SAMPLE #: MW-5A
REIC SAMPLE #: 45811-7

DATE SAMPLED: 09-19-96
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	0.186	mg/l	8260A	0.001	09-27-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	100
toluene-d8	100
4-bromofluorobenzene	97

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-5B
REIC SAMPLE #: 45811-8

DATE SAMPLED: 09-19-96
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	2.87	mg/l	8260A	0.001	09-27-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	102
toluene-d8	100
4-bromofluorobenzene	99

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-20A
REIC SAMPLE #: 45811-9

DATE SAMPLED: 09-20-96
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	7.45	mg/l	8260A	0.100	09-27-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	98
toluene-d8	100
4-bromofluorobenzene	97

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-20B **DATE SAMPLED: 09-20-96**
REIC SAMPLE #: 45811-10 **MATRIX: LIQUID**

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	1.18	mg/l	8260A	0.001	09-27-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	97
toluene-d8	100
4-bromofluorobenzene	97

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-14 **DATE SAMPLED:** 09-19-96
REIC SAMPLE #: 45811-12 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	ND	mg/l	8260A	0.001	09-26-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	101
toluene-d8	101
4-bromofluorobenzene	99

ND - None Detected
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-7
REIC SAMPLE #: 45811-13

DATE SAMPLED: 09-20-96
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	3.03	mg/l	8260A	0.200	09-26-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	96
toluene-d8	100
4-bromofluorobenzene	97

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-22R   **DATE SAMPLED:** 09-19-96
REIC SAMPLE #: 45811-14   **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.015	mg/l	8260A	0.001	09-26-96/TL
trichloroethene	0.012	mg/l	8260A	0.001	09-26-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	99
toluene-d8	100
4-bromofluorobenzene	95

MQL - Minimum Quantifying Level

Monsanto Company, The Chemical Group
Job #: 0996-45811

MONSANTO SAMPLE #: MW-24A
REIC SAMPLE #: 45811-15

DATE SAMPLED: 09-20-96
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.894	mg/l	8260A	0.200	09-26-96/TL
trichloroethene	0.568	mg/l	8260A	0.200	09-26-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	102
toluene-d8	101
4-bromofluorobenzene	99

MQL - Minimum Quantifying Level

DATE 10-3-96 APPROVED [signature]
Ray Erickson

Morsanto Company, The Chemical Group
Job #: 0996-45811

MONSANTO SAMPLE #: MW-23A
REIC SAMPLE #: 45811-11

DATE SAMPLED: 09-20-96
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	1.47	mg/l	8260A	0.100	09-26-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	96
toluene-d8	100
4-bromofluorobenzene	97

MQL - Minimum Quantifying Level

Pert. Mon. 3296
Addendum

MONSANTO COMPANY
THE CHEMICAL GROUP
1 MONSANTO DRIVE
NITRO WV 25143

REIC JOB #: 0996-45811 - ADDENDUM REPORT
SITE ID & STATE: MONSANTO - FLEXSYS PLANT
PROJECT ID: 96x150.003
CUSTODY NO.: 2767 & 2768

Prepared By:
REIC LABORATORY
PO Box 286
Beaver WV 25813

MONSANTO SAMPLE #: WT-15A **DATE SAMPLED:** 09-18-96
REIC SAMPLE #: 45811-1 **MATRIX:** LIQUID

ADDITIONAL SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
o-cresol	ND	mg/l	625	0.020	09-27-96/WP
m,p-cresol	ND	mg/l	625	0.040	09-27-96/WP

Surrogates	% Recovery
2-fluorophenol	34
phenol-d6	30
2,4,6-tribromophenol	112

ND - None Detected at MQL
MQL - Minimum Quantifying Level
Note - Parameters requested post original analyses.

MONSANTO SAMPLE #: WT-14A
REIC SAMPLE #: 45811-2

DATE SAMPLED: 09-19-96
MATRIX: LIQUID

ADDITIONAL SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
o-cresol	0.336	mg/l	625	0.020	10-01-96/WP
m,p-cresol	*7.20	mg/l	625	0.040	10-01-96/WP

Surrogates	% Recovery
2-fluorophenol	28
phenol-d6	29
2,4,6-tribromophenol	103

MQL - Minimum Quantifying Level
* - Analytical run exceeded calibration range, therefore value is considered an estimate.
Note - Parameters requested post original analyses.

MONSANTO SAMPLE #: WT-13A
REIC SAMPLE #: 45811-3
DATE SAMPLED: 09-19-96
MATRIX: LIQUID

ADDITIONAL SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
o-cresol	ND	mg/l	625	0.020	09-27-96/WP
m,p-cresol	ND	mg/l	625	0.040	09-27-96/WP

Surrogates	% Recovery
2-fluorophenol	27
phenol-d6	22
2,4,6-tribromophenol	95

ND - None Detected at MQL
MQL - Minimum Quantifying Level
Note - Parameters requested post original analyses.

Monsanto Company, The Chemical Group
Job #: 0996-45811

MONSANTO SAMPLE #: TD-5 **DATE SAMPLED:** 09-19-96
REIC SAMPLE #: 45811-4 **MATRIX:** LIQUID

ADDITIONAL SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
o-cresol	ND	mg/l	625	0.020	09-27-96/WP
m,p-cresol	ND	mg/l	625	0.040	09-27-96/WP

Surrogates	% Recovery
2-fluorophenol	28
phenol-d6	24
2,4,6-tribromophenol	86

ND - None Detected at MQL
MQL - Minimum Quantifying Level
Note - Parameters requested post original analyses.

DATE 12-2-96

APPROVED
Ray Erickson

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring   Date: 9-20-1996

Well No: MW-7   Sample Collection Time: 10:35

Well Total Depth: 30'   Casing Head Elevation: 594.03

Depth to Water: 27.31   Elevation of Water Level: 566.72

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 2.69) x 3 =

Purge Volume 1.37 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer X or Pump ____

Initial: Temperature 13.8 °C; pH 5.29; Sp. Conductance 1.15ms.

Intermed: Temperature ____ °C; pH ____; Sp. Conductance ____.

Final: Temperature ____ °C; pH ____; Sp. Conductance ____.

Pump depth: ____ feet.

Volume Purged: ____ gallons; Rate of Purge: ____ gal/min.

Sample Protocol: ____

Comments: Dave Junker bailed off product and rest of water in well.

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-20-1996

Well No: MW-1B Sample Collection Time: 12:23

Well Total Depth: 55' Casing Head Elevation: 594.38

Depth to Water: 18.47 Elevation of Water Level: 575.91

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 36.53) x 3 =

Purge Volume 18.6 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 15.8 °C; pH 4.77; Sp. Conductance 686 µs.

Intermed: Temperature 18.4 °C; pH 4.88; Sp. Conductance 768 µs.

Final: Temperature 18.4 °C; pH 4.91; Sp. Conductance 774 µs.

Pump depth: 52 feet.

Volume Purged: 20 gallons; Rate of Purge: 0.75 gal/min.

Sample Protocol: Water was very clear.

Comments:

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring   Date: 9-20-1996

Well No: MW-23A   Sample Collection Time: 13:17

Well Total Depth: 35   Casing Head Elevation: 598.82

Depth to Water: 27.83   Elevation of Water Level: 570.99

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 7.17) x 3 =

Purge Volume 13.76 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 17.5 °C; pH 5.33; Sp. Conductance 2.07ms.

Intermed: Temperature 15.9 °C; pH 6.58; Sp. Conductance 1.87ms.

Final: Temperature 17.4 °C; pH 6.47; Sp. Conductance 2.02ms.

Pump depth: 35.5 feet.

Volume Purged: 6.5 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: ______________________________

Comments: Purged 5 gallons and well was dry. Waited 10-15 minutes. Purged an additional 1.5 gallons and sampled.

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-19-1996

Well No: MW-5A Sample Collection Time: 19:27

Well Total Depth: 33' Casing Head Elevation: 594.65

Depth to Water: 25.07 Elevation of Water Level: 569.58

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 7.93) x 3 =

Purge Volume 4.04 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 18.5 °C; pH 5.88; Sp. Conductance 0.98ms.

Intermed: Temperature 19.4 °C; pH 5.06; Sp. Conductance 1.04ms.

Final: Temperature 19.4 °C; pH 4.98; Sp. Conductance 1.07ms.

Pump depth: 32 feet.

Volume Purged: 7.5 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: ____

Comments: Purge water cleared up, but still had a very light greenish/grayish tint to it. Seemed to recharge quickly.

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-19-1996

Well No: MW-5B Sample Collection Time: 19:44

Well Total Depth: 56' Casing Head Elevation: 594.91

Depth to Water: 25.35' Elevation of Water Level: 569.56

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 30.65) x 3 =

Purge Volume 15.63 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 18.4 °C; pH 5.20; Sp. Conductance 3.40ms.

Intermed: Temperature 18.5 °C; pH 5.33; Sp. Conductance 2.43ms.

Final: Temperature 18.5 °C; pH 5.42; Sp. Conductance 2.46ms.

Pump depth: 54 feet.

Volume Purged: 19 gallons; Rate of Purge: 0.75 gal/min.

Sample Protocol: ____________________

Comments: Initial purge water-very dirty brown. Cleared up, but had a very light greenish/grayish tint to it.

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-20-1996

Well No: MW-20A Sample Collection Time: 09:45

Well Total Depth: 40' Casing Head Elevation: 596.71

Depth to Water: 27.18' Elevation of Water Level: 569.53

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 12.82) x 3 =

Purge Volume 6.53 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 15.3 °C; pH 5.11; Sp. Conductance 1.43ms.

Intermed: Temperature ____ °C; pH ____; Sp. Conductance ____ μs.

Final: Temperature 16.0 °C; pH 6.39; Sp. Conductance 1388μs.

Pump depth: 39.5 feet.

Volume Purged: 3 gallons; Rate of Purge: 0.25 gal/min.

Sample Protocol: ____

Comments: Purged 1.75 gallons and well was dry. Waited approximately 30 minutes. Purged approximately 1.25 and sampled; well was dry again. Samples were a dirty gray color.

Sampler: T. Sedosky

SWL - Static Water Level

Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: **Monsanto Performance Monitoring** Date: 9-20-1996

Well No: MW-20B Sample Collection Time: 09:37

Well Total Depth: 57' Casing Head Elevation: 596.76

Depth to Water: 27.22' Elevation of Water Level: 569.54

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 29.78) x 3 =

Purge Volume 15.18 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 16.9 °C; pH 5.50; Sp. Conductance 3.85ms.

Intermed: Temperature 16.9 °C; pH 6.42; Sp. Conductance 6.65ms.

Final: Temperature 17.4 °C; pH 6.67; Sp. Conductance 15.4µs.

Pump depth: 55 feet.

Volume Purged: 16 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: ____________________

Comments: Initial purge water very dirty dark brown, almost black. Has an odor. Water never cleared up. Very dark brown; frothy.

Sampler: T. Sedosky

SWL - Static Water Level

Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-19-1996

Well No: WT-13A Sample Collection Time: 14:00

Well Total Depth: 35.06 Casing Head Elevation: 590.82

Depth to Water: 24.19 Elevation of Water Level: 566.63

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 10.87) x 3 =

Purge Volume 20.87 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 17.1 °C; pH 6.90; Sp. Conductance 0.91ms.

Intermed: Temperature 16.4 °C; pH 6.17; Sp. Conductance 1157µs.

Final: Temperature 15.5 °C; pH 5.87; Sp. Conductance 1196µs.

Pump depth: 34.5 feet.

Volume Purged: 17.5 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: ____

Comments: Purge water 0 gallons to 7 gallons -very cloudy and brownish red. Purged 11 gallons and well was alnost dry. Let recharge and returned-purged 6.5 gallons and sampled.

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-19-1996

Well No: TD-5 Sample Collection Time: 08:50

Well Total Depth: 30.40 Casing Head Elevation: 589.49

Depth to Water: 22.71 Elevation of Water Level: 566.78

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 7.69) x 3 =

Purge Volume 3.92 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 13.6 °C; pH 5.03; Sp. Conductance 1.27ms.

Intermed: Temperature 13.7 °C; pH 5.49; Sp. Conductance 1.53µs.

Final: Temperature 13.6 °C; pH 5.39; Sp. Conductance 1.88µs.

Pump depth: ________ feet.

Volume Purged: 4.5 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: ________

Comments: Somewhat cloudy at first, but cleared up.

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-20-1996

Well No: MW-1A Sample Collection Time: 12:20

Well Total Depth: 32' Casing Head Elevation: 594.37

Depth to Water: 18.37 Elevation of Water Level: 576.0

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 13.63) x 3 =

Purge Volume 6.95 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer X or Pump ____

Initial: Temperature ____ °C; pH ____; Sp. Conductance ____ µs.

Intermed: Temperature 16.4 °C; pH 5.03; Sp. Conductance 912 µs.

Final: Temperature 16.2 °C; pH 5.35; Sp. Conductance 903 µs.

Pump depth: NA feet.

Volume Purged: 9 gallons; Rate of Purge: NA gal/min.

Sample Protocol: ____________________

Comments: Initial purge water was a dark red. Well recharged somewhat decently. Sample water still had a very light orangeish tint to it.

Sampler: T. Sedosky

SWL - Static Water Level

Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-19-1996

Well No: MW-14 Sample Collection Time: 17:10

Well Total Depth: 29' Casing Head Elevation: 589.53

Depth to Water: 15.43 Elevation of Water Level: 574.10

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 13.57) x 3 =

Purge Volume 6.9 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 16.1 °C; pH 6.46; Sp. Conductance 318 µs.

Intermed: Temperature 14.8 °C; pH 5.38; Sp. Conductance 327 µs.

Final: Temperature 14.1 °C; pH 5.20; Sp. Conductance 335 µs.

Pump depth: 28 feet.

Volume Purged: 10 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: ____

Comments: 0-5 gallons, water was cloudy; 5-7 gallons, medium cloudy; 7-10 gallons, very clear.

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-19-1996

Well No: MW-22R Sample Collection Time: 17:45

Well Total Depth: 40.0 Casing Head Elevation: 596.53

Depth to Water: 28.68 Elevation of Water Level: 567.85

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 11.32) x 3 =

Purge Volume 21.73 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 20.1 °C; pH 5.79; Sp. Conductance 2.47ms.

Intermed: Temperature 17.6 °C; pH 6.24; Sp. Conductance 2.70ms.

Final: Temperature 17.3 °C; pH 5.59; Sp. Conductance 3.64ms.

Pump depth: 39.5 feet.

Volume Purged: 13 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: ____________________

Comments: Slight odor. Purged water cleared up after approximately 2.5 gallons, but not recharging. .75 hour later, purged 1 gallon and sampled. At 11 gallons, visible sheen on purge water.

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-19-1996

Well No: WT-14A Sample Collection Time: 11:23

Well Total Depth: 35.43 Casing Head Elevation: 593.57

Depth to Water: 25.43 Elevation of Water Level: 568.14

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 10.0) x 3 = Purge Volume 19.2 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer _____ or Pump X

Initial: Temperature 14.3 °C; pH 7.94; Sp. Conductance 12.7ms.

Intermed: Temperature 14.9 °C; pH 7.88; Sp. Conductance 11.4ms.

Final: Temperature 16.0 °C; pH 8.21; Sp. Conductance 11.1ms.

Pump depth: 35 feet.

Volume Purged: 20 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: __________

Comments: Initial water purged very cloudy; 0 gallons to 8 gallons. At approximately 13 gallons, noticed a greenish tint to water. Bailer is stained green. Very strong Phenol(?) odor. Water stayed green 13 gallons to 20 gallons. Also had to delay final purging and sampling so well could recharge--70 minutes.

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-18-1996

Well No: WT-15A Sample Collection Time: 17:00

Well Total Depth: 24.87 Casing Head Elevation: 589.08

Depth to Water: 6.32 Elevation of Water Level: 582.76

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 18.55) x 3 =

Purge Volume 35.61 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 16.9 °C; pH 4.84; Sp. Conductance 650 µs.

Intermed: Temperature 16.9 °C; pH 5.17; Sp. Conductance 437 µs.

Final: Temperature 18.0 °C; pH 5.36 ; Sp. Conductance 649 µs.

Pump depth: 23 feet.

Volume Purged: 36 gallons; Rate of Purge: 1 gal/min.

Sample Protocol: ____________________

Comments: Very strong Phenol odor.

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-20-1996

Well No: MW-24A Sample Collection Time: 15:05

Well Total Depth: 35' Casing Head Elevation: 594.58

Depth to Water: 26.90 Elevation of Water Level: 567.68

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 8.1) x 3 =

Purge Volume 15.55 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer X or Pump ____

Initial: Temperature ____ °C; pH ____; Sp. Conductance ____ ms.

Intermed: Temperature ____ °C; pH ____; Sp. Conductance ____ ms.

Final: Temperature 19.1 °C; pH 5.50; Sp. Conductance 3.99ms.

Pump depth: N/A feet.

Volume Purged: 16.5 gallons; Rate of Purge: ____ gal/min.

Sample Protocol: ____

Comments: Strong odor. Nasty black sludge.

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

4TH QUARTER 1996

DRAFT

TERRADON CORPORATION
P O BOX 519
NITRO WEST VIRGINIA 25143

REIC JOB #: 1296-47717
SAMPLING SITE: MONSANTO-FLEXSYS PLANT
PROJECT #: 96X150.003
CUSTODY NO.: 2879 AND 2880

Prepared By:
REIC LABORATORY
P O Box 286
Beaver WV 25813

TERRADON SAMPLE #: WT-15A   **DATE SAMPLED:** 12-05-96
REIC SAMPLE #: 47717-1   **MATRIX:** LIQUID

SEMIVOLATILE ORGANIC COMPOUNDS/ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	12-14-96/WP
2-chlorophenol	ND	mg/l	8270B	0.020	12-14-96/WP
2-nitrophenol	ND	mg/l	8270B	0.020	12-14-96/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	12-14-96/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	12-14-96/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	12-14-96/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	12-14-96/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	12-14-96/WP
4-nitrophenol	ND	mg/l	8270B	0.020	12-14-96/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	12-14-96/WP
pentachlorophenol	ND	mg/l	8270B	0.020	12-14-96/WP
o-cresol	ND	mg/l	8270B	0.020	12-14-96/WP
m,p-cresol	ND	mg/l	8270B	0.040	12-14-96/WP

Surrogates	% Recovery
2-fluorophenol	55
phenol-d6	40
2,4,6-tribromophenol	85

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.010	mg/l	8260A	0.001	12-15-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	106
toluene-d8	103
4-bromofluorobenzene	103

ND - None Detected at MQL
MQL - Minimum Quantifying Level

TERRADON SAMPLE #: WT-14A
REIC SAMPLE #: 47717-2

DATE SAMPLED: 12-05-96
MATRIX: LIQUID

SEMIVOLATILE ORGANIC COMPOUNDS/ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	0.089	mg/l	8270B	0.020	12-14-96/WP
2-chlorophenol	ND	mg/l	8270B	0.020	12-14-96/WP
2-nitrophenol	ND	mg/l	8270B	0.020	12-14-96/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	12-14-96/WP
2,4-dichlorophenol	0.036	mg/l	8270B	0.020	12-14-96/WP
4-chloro-3-methylphenol	0.167	mg/l	8270B	0.020	12-14-96/WP
2,4,6-trichlorophenol	0.074	mg/l	8270B	0.020	12-14-96/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	12-14-96/WP
4-nitrophenol	ND	mg/l	8270B	0.020	12-14-96/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	12-14-96/WP
pentachlorophenol	ND	mg/l	8270B	0.020	12-14-96/WP
o-cresol	0.031	mg/l	8270B	0.020	12-14-96/WP
m,p-cresol	2.87	mg/l	8270B	0.040	12-14-96/WP

Surrogates	% Recovery
2-fluorophenol	23
phenol-d6	17
2,4,6-tribromophenol	79

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	ND	mg/l	8260A	0.001	12-13-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	106
toluene-d8	101
4-bromofluorobenzene	100

ND - None Detected at MQL
MQL - Minimum Quantifying Level

TERRADON SAMPLE #: WT-13A **DATE SAMPLED:** 12-05-96
REIC SAMPLE #: 47717-3 **MATRIX:** LIQUID

SEMIVOLATILE ORGANIC COMPOUNDS/ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	12-14-96/WP
2-chlorophenol	ND	mg/l	8270B	0.020	12-14-96/WP
2-nitrophenol	ND	mg/l	8270B	0.020	12-14-96/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	12-14-96/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	12-14-96/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	12-14-96/WP
2,4,6-trichlorophenol	0.193	mg/l	8270B	0.020	12-14-96/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	12-14-96/WP
4-nitrophenol	ND	mg/l	8270B	0.020	12-14-96/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	12-14-96/WP
pentachlorophenol	ND	mg/l	8270B	0.020	12-14-96/WP
o-cresol	ND	mg/l	8270B	0.020	12-14-96/WP
m,p-cresol	ND	mg/l	8270B	0.040	12-14-96/WP

Surrogates	% Recovery
2-fluorophenol	27
phenol-d6	19
2,4,6-tribromophenol	91

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.005	mg/l	8260A	0.001	12-13-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	106
toluene-d8	101
4-bromofluorobenzene	99

ND - None Detected at MQL
MQL - Minimum Quantifying Level

TERRADON SAMPLE #: TD-5 DATE SAMPLED: 12-05-96
REIC SAMPLE #: 47717-4 MATRIX: LIQUID

SEMIVOLATILE ORGANIC COMPOUNDS/ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	12-14-96/WP
2-chlorophenol	ND	mg/l	8270B	0.020	12-14-96/WP
2-nitrophenol	ND	mg/l	8270B	0.020	12-14-96/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	12-14-96/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	12-14-96/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	12-14-96/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	12-14-96/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	12-14-96/WP
4-nitrophenol	ND	mg/l	8270B	0.020	12-14-96/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	12-14-96/WP
pentachlorophenol	ND	mg/l	8270B	0.020	12-14-96/WP
o-cresol	ND	mg/l	8270B	0.020	12-14-96/WP
m,p-cresol	ND	mg/l	8270B	0.040	12-14-96/WP

Surrogates	% Recovery
2-fluorophenol	25
phenol-d6	18
2,4,6-tribromophenol	89

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.010	mg/l	8260A	0.001	12-13-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	110
toluene-d8	102
4-bromofluorobenzene	101

ND - None Detected at MQL
MQL - Minimum Quantifying Level

TERRADON SAMPLE #:	**MW-1A**	**DATE SAMPLED:**	**12-06-96**
REIC SAMPLE #:	**47717-5**	**MATRIX:**	**LIQUID**

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	0.060	mg/l	8260A	0.001	12-15-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	109
toluene-d8	102
4-bromofluorobenzene	102

MQL - Minimum Quantifying Level

TERRADON SAMPLE #: MW-1B **DATE SAMPLED:** 12-06-96
REIC SAMPLE #: 47717-6 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	0.023	mg/l	8260A	0.001	12-15-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	109
toluene-d8	102
4-bromofluorobenzene	102

MQL - Minimum Quantifying Level

TERRADON SAMPLE #: MW-5A
REIC SAMPLE #: 47717-7

DATE SAMPLED: 12-06-96
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	1.70	mg/l	8260A	0.001	12-15-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	109
toluene-d8	100
4-bromofluorobenzene	99

MQL - Minimum Quantifying Level

TERRADON SAMPLE #: MW-5B **DATE SAMPLED:** 12-06-96
REIC SAMPLE #: 47717-8 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	3.04	mg/l	8260A	0.001	12-16-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	110
toluene-d8	100
4-bromofluorobenzene	99

MQL - Minimum Quantifying Level

TERRADON SAMPLE #: MW-20A
REIC SAMPLE #: 47717-9

DATE SAMPLED: 12-06-96
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	7.11	mg/l	8260A	0.001	12-15-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	109
toluene-d8	99
4-bromofluorobenzene	98

MQL - Minimum Quantifying Level

TERRADON SAMPLE #: MW-20B
REIC SAMPLE #: 47717-10
DATE SAMPLED: 12-06-96
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	1.13	mg/l	8260A	0.001	12-15-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	119
toluene-d8	102
4-bromofluorobenzene	104

MQL - Minimum Quantifying Level

TERRADON SAMPLE #: MW-23A **DATE SAMPLED:** 12-05-96
REIC SAMPLE #: 47717-11 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	1.45	mg/l	8260A	0.001	12-15-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	117
toluene-d8	102
4-bromofluorobenzene	103

MQL - Minimum Quantifying Level

TERRADON SAMPLE #: MW-22R **DATE SAMPLED:** 12-05-96
REIC SAMPLE #: 47717-14 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.021	mg/l	8260A	0.001	12-14-96/TL
trichloroethene	0.019	mg/l	8260A	0.001	12-14-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	*132
toluene-d8	105
4-bromofluorobenzene	115

MQL - Minimum Quantifying Level
* - Surrogate Recovery exceeds REIC control limits due to sample matrix interference.

TERRADON SAMPLE #: MW-24A
REIC SAMPLE #: 47717-15

DATE SAMPLED: 12-06-96
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	1.08	mg/l	8260A	0.040	12-14-96/TL
trichloroethene	0.657	mg/l	8260A	0.040	12-14-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	*126
toluene-d8	104
4-bromofluorobenzene	106

MQL - Minimum Quantifying Level
* - Surrogate Recovery exceeds REIC control limits due to sample matrix interference.

TERRADON SAMPLE #: **TRIP BLANK** **MATRIX:** **LIQUID**
REIC SAMPLE #: **47717-16**

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	ND	mg/l	8260A	0.001	12-14-96/TL
trichloroethene	ND	mg/l	8260A	0.001	12-14-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	109
toluene-d8	103
4-bromofluorobenzene	103

ND - None Detected at MQL
MQL - Minimum Quantifying Level

DATE 12-16-96

APPROVED J M Satterfield
for Ray Erickson

TERRADON SAMPLE #: MW-14
REIC SAMPLE #: 47717-12

DATE SAMPLED: 12-05-96
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.001	mg/l	8260A	0.001	12-14-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	110
toluene-d8	103
4-bromofluorobenzene	103

MQL - Minimum Quantifying Level

TERRADON SAMPLE #: MW-7 **DATE SAMPLED:** 12-06-96
REIC SAMPLE #: 47717-13 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	ND	mg/l	8260A	0.001	12-14-96/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	110
toluene-d8	102
4-bromofluorobenzene	81

ND - None Detected at MQL
MQL - Minimum Quantifying Level

TERRADON
P.O. Box 519
Nitro, WV 25143
(304) 755-8291
FAX 755-2636

Custody No. 2879

Date: 12-09-96

CHAIN-OF-CUSTODY RECORD

SAMPLE COLLECTION INFORMATION

Person to Contact: Dave Junker   Telephone: (304) 755-8291

Sampling Site: Monsanto - Flexsys Plant

Project #: 96x150.003   Sampler: T.S.

Date of Sample Shipment: 12-9-96   How Shipped: Picked-Up

SAMPLE LOG AND ANALYSES REQUEST

TURNAROUND REQUIREMENTS
X Regular
___ Rush

Analysis Requested

Sample ID	Containers # and Type	Date	Time	Matrix	Grab / Comp.	Benzene	Phenols	TCE				Remarks
WT-15A	1-1L (G)	12-5-96	1027	Liquid	G	X	X					
WT-15A	2-40 mL (G)	12-5-96	1027		G	X	X					
WT-14A	1-1L (G)	12-5-96	1358		G	X	X					
WT-14A	2-40 mL (G)	12-5-96	1358		G	X	X					
WT-13A	1-1L (G)	12-5-96	~~1358~~ 1137		G	X	X					
WT-13A	2-40 mL (G)	12-5-96	1137		G	X	X					
TD-5	1-1L (G)	12-5-96	1436		G	X	X					
TD-5	2-40 mL (G)	12-5-96	1436		G	X	X					
MW-1A	2-40 mL (G)	12-6-96	1415		G			X				
MW-1B	2-40 mL (G)	12-6-96	1410		G			X				
MW-5A	2-40 mL (G)	12-6-96	1049		G			X				
MW-5B	2-40 mL (G)	12-6-96	1045		G			X				

Relinquished by (Signature)	Date/Time	Received by (Signature)	Relinquished by (Signature)	Date/Time	Received by (Signature)
Timothy B. Sedoky	12-9-96 1000	Jim Smith			

Relinquished by (Signature)	Date/Time	Received for Laboratory by (Signature)	Date/Time	Condition on Arrival
Jim Smith	12/9 400	[illegible]	12/9/96	@ 4:30 4.0°C OK

Comments: FOR PHENOLS: STANDARD PHENOLIC LIST PLUS O-CRESOL, AND M, P-CRESOL. THANKS.

Possible Interfering Compounds ______

Requested by: [signature]

LAB I.D. NO. 47717

CONTINUED ON # 2880

ORIGINAL

TERRADON
P.O. Box 519
Nitro, WV 25143
(304) 755-8291
FAX 755-2636

Custody No. 2879

Date: 12-09-96

CHAIN-OF-CUSTODY RECORD

SAMPLE COLLECTION INFORMATION

Person to Contact: Dave Junker Telephone: (304) 755-8291

Sampling Site: Monsanto – Flexsys Plant

Project #: 96x150.003 Sampler: T.S.

Date of Sample Shipment: 12-9-96 How Shipped: Picked-up

SAMPLE LOG AND ANALYSES REQUEST

TURNAROUND REQUIREMENTS

X Regular

___ Rush

Analysis Requested

Sample ID	Containers # and Type	Date	Time	Matrix	Grab / Comp.	BENZENE	PHENOLS	TCE				Remarks
WT-15A	1-1L (G)	12-5-96	1027	Liquid	G	X	X					
WT-15A	2-40 mL (G)	12-5-96	1027		G	X	X					
WT-14A	1-1L (G)	12-5-96	1358		G	X	X					
WT-14A	2-40 mL (G)	12-5-96	1358		G	X	X					
WT-13A	1-1L (G)	12-5-96	~~1358~~ 1137		G	X	X					
WT-13A	2-40 mL (G)	12-5-96	1137		G	X	X					
TD-5	1-1L (G)	12-5-96	1436		G	X	X					
TD-5	2-40 mL (G)	12-5-96	1436		G	X	X					
MW-1A	2-40 mL (G)	12-6-96	1415		G			X				
MW-1B	2-40 mL (G)	12-6-96	1410		G			X				
MW-5A	2-40 mL (G)	12-6-96	1049		G			X				
MW-5B	2-40 mL (G)	12-6-96	1045		G			X				

Relinquished by (Signature)	Date/Time	Received by (Signature)	Relinquished by (Signature)	Date/Time	Received by (Signature)
Timothy B. Sedosky	12-9-96 1000	[signature]			
Relinquished by (Signature)	**Date/Time**	**Received for Laboratory by (Signature)**	**Date/Time**	**Condition on Arrival**	
[signature]	12/9 400	[signature]	12/9/96	@ 4:30	4.0°C OK

Comments: FOR PHENOLS: STANDARD PHENOLIC LIST PLUS O-CRESOL, AND M,P-CRESOL. THANKS.

Possible Interfering Compounds ____________

Requested by: [signature]

LAB I.D. NO. 47717

CONTINUED ON # 2880

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-5-1996

Well No: WT-15A Sample Collection Time: 10:27

Well Total Depth: 24.87 Casing Head Elevation: 589.08

Depth to Water: 6.80 Elevation of Water Level: 582.28

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 18.07) x 3 =

Purge Volume 34.69 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 14.7 °C; pH 7.5 ; Sp. Conductance 412 µS.

Intermed: Temperature 14.5 °C; pH 6.3 ; Sp. Conductance 417 µS.

Final: Temperature 14.5 °C; pH 5.7 ; Sp. Conductance 445 µS.

Pump depth: 23 feet.

Volume Purged: 35 gallons; Rate of Purge: 1.0 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Initial purge water light brown tint with strong phenol odor. 15 gallons to 35 gallons-water is clear. Phenol odor.

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-5-1996

Well No: WT-13A Sample Collection Time: 11:37

Well Total Depth: 35.06 Casing Head Elevation: 590.82

Depth to Water: 22.26 Elevation of Water Level: 568.56

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 12.8) x 3 =

Purge Volume 24.57 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer _____ or Pump X

Initial: Temperature 14.7 °C; pH 4.8 ; Sp. Conductance 631 µs.

Intermed: Temperature 14.9 °C; pH 4.8 ; Sp. Conductance 616 µs.

Final: Temperature 14.7 °C; pH 4.7 ; Sp. Conductance 627 µs.

Pump depth: 34.0 feet.

Volume Purged: 26 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Purge water 0 gallons to 5 gallons -very cloudy and brownish red; 5 gallons to 8 gallons still has light brown/red tint; has cleared up a little. 8 gallons to 26 gallons mostly clear. Still a light tint to water.

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-5-1996

Well No: WT-14A Sample Collection Time: 13:58

Well Total Depth: 35.43 Casing Head Elevation: 593.57

Depth to Water: 21.75 Elevation of Water Level: 571.82

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 13.68) x 3 =
Purge Volume 26.26 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 13.5 °C; pH 6.9 ; Sp. Conductance 1429μs.

Intermed: Temperature 15.2 °C; pH 7.8 ; Sp. Conductance 1416μs.

Final: Temperature 14.6 °C; pH 7.6 ; Sp. Conductance 1380μs.

Pump depth: 28.5 feet. (Because of bailer)

Volume Purged: 27 gallons; Rate of Purge: 0.75 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Bailer is stuck in well. Pulled on rope, but it finally broke. Light green stained water. Phenol odor. At 15 gallons, noticed a blue/green tint to water.

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-5-1996

Well No: TD-5 Sample Collection Time: 14:36

Well Total Depth: 30.40 Casing Head Elevation: 589.49

Depth to Water: 20.85 Elevation of Water Level: 568.64

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 9.55) x 3 =

Purge Volume 4.87 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 14.5 °C; pH 7.8 ; Sp. Conductance 767 μs.

Intermed: Temperature 14.8 °C; pH 7.2 ; Sp. Conductance 747 μs.

Final: Temperature 14.7 °C; pH 6.0 ; Sp. Conductance 716 μs.

Pump depth: 29.75 feet.

Volume Purged: 7.5 gallons; Rate of Purge: 0.75 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Water has light brown/orange tint to it. Did not up much.

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-5-1996

Well No: MW-22R Sample Collection Time: 16:01

Well Total Depth: 40.0 Casing Head Elevation: 596.53

Depth to Water: 27.32 Elevation of Water Level: 569.21

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 12.68) x 3 =

Purge Volume 24.34 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 16.0 °C; pH 5.6 ; Sp. Conductance 925 µs.

Intermed: Temperature 16.4 °C; pH 6.3 ; Sp. Conductance 980 µs.

Final: Temperature 16.2 °C; pH 6.4 ; Sp. Conductance 981 µs.

Pump depth: 39.0 feet.

Volume Purged: 25 gallons; Rate of Purge: 0.75 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Initial purge water was very cloudy. After 5 gallons cleared a lot, but has a gray tint. Medium odor. At about 20 gallons, water turned to a brownish tint.

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-5-1996

Well No: MW-14 Sample Collection Time: 16.51

Well Total Depth: 29' Casing Head Elevation: 589.53

Depth to Water: 15.18 Elevation of Water Level: 574.35

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 13.82) x 3 =

Purge Volume 7.05 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 14.2 °C; pH 6.6 ; Sp. Conductance 267 µs.

Intermed: Temperature 14.8 °C; pH 5.7 ; Sp. Conductance 255 µs.

Final: Temperature 14.8 °C; pH 4.1 ; Sp. Conductance 253 µs.

Pump depth: 29 feet.

Volume Purged: 8.5 gallons; Rate of Purge: 0.75 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Initial purge very dirty light brown. Cleared some after 2 gallons. After 3.5 gallons, mostly clear.

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-5-1996

Well No: MW-23A Sample Collection Time: 17:42

Well Total Depth: 35 Casing Head Elevation: 598.82

Depth to Water: 27.08 Elevation of Water Level: 571.74

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 7.92) x 3 =

Purge Volume 15.20 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 14.9 °C; pH 5.2 ; Sp. Conductance 753 µS.

Intermed: Temperature ______ °C; pH ______; Sp. Conductance ______ µS.

Final: Temperature 15.1 °C; pH 5.2 ; Sp. Conductance 760 µS.

Pump depth: 34/34.75 feet.

Volume Purged: 7.0 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Lightly stained purge water. Slight odor. Purged 6.5 gallons and well was dry. Let recharge about 10 minutes. Took final readings and sampled.

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-6-1996

Well No: MW-7 Sample Collection Time: 10:20

Well Total Depth: 30' Casing Head Elevation: 594.03

Depth to Water: 25.75 Elevation of Water Level: 568.28

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 4.25) x 3 =

Purge Volume 2.16 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer X or Pump ____

Initial: Temperature 13.8 °C; pH 6.7 ; Sp. Conductance 616 µS.

Intermed: Temperature 13.7 °C; pH 6.5 ; Sp. Conductance 620 µS.

Final: Temperature ____ °C; pH ____; Sp. Conductance ____ µS.

Pump depth: ________ feet.

Volume Purged: 2.5 gallons; Rate of Purge: ____ gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Bailed about 2.5 gallons. Dave Junker going to sample after well recharges.

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-6-1996

Well No: MW-5B Sample Collection Time: 10:45

Well Total Depth: 56' Casing Head Elevation: 594.91

Depth to Water: 24.69' Elevation of Water Level: 570.22

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 31.31) x 3 =

Purge Volume 15.96 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 18.0 °C; pH 6.6 ; Sp. Conductance 828 µs.

Intermed: Temperature 19.0 °C; pH 5.5 ; Sp. Conductance 850 µs.

Final: Temperature 19.1 °C; pH 5.0 ; Sp. Conductance 846 µs.

Pump depth: 40 feet.

Volume Purged: 17 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments:

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-6-1996

Well No: MW-5A Sample Collection Time: 10:49

Well Total Depth: 33' Casing Head Elevation: 594.65

Depth to Water: 24.42 Elevation of Water Level: 570.23

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 8.58) x 3 =

Purge Volume 4.37 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 20.3 °C; pH 5.3 ; Sp. Conductance 620 µs.

Intermed: Temperature 20.8 °C; pH 4.4 ; Sp. Conductance 624 µs.

Final: Temperature 20.3 °C; pH 4.3 ; Sp. Conductance 620 µs.

Pump depth: 31.5 feet.

Volume Purged: 5.5 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Dull brown/orange tint to water.

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-6-1996

Well No: MW-20B Sample Collection Time: 11:51

Well Total Depth: 57' Casing Head Elevation: 596.76

Depth to Water: 26.50' Elevation of Water Level: 570.26

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 30.50) x 3 =

Purge Volume 15.55 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 18.0 °C; pH 4.5 ; Sp. Conductance 734 µs.

Intermed: Temperature 18.4 °C; pH 4.8 ; Sp. Conductance 1235µs.

Final: Temperature 18.3 °C; pH 4.9 ; Sp. Conductance 1228µs.

Pump depth: 40 feet.

Volume Purged: 18 gallons; Rate of Purge: 0.75 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: 0-2.5 gallons-very clear, 2.5-18 gallons, dark brown stain/frothy/strong odor. Air bubbles in both samples. Numerous attempts to get a proper sample, but could not get "bubble free". Very frothy water.

Sampler: T. Sedosky

SWL - Static Water Level

Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-6-1996

Well No: MW-20A Sample Collection Time: 12:10

Well Total Depth: 40' Casing Head Elevation: 596.71

Depth to Water: 26.48 Elevation of Water Level: 570.23

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 13.52) x 3 =

Purge Volume 6.89 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer _____ or Pump X

Initial: Temperature 17.2 °C; pH 5.1 ; Sp. Conductance 684 µs.

Intermed: Temperature 17.0 °C; pH 6.8 ; Sp. Conductance 740 µs.

Final: Temperature 16.9 °C; pH 6.8 ; Sp. Conductance 735 µs.

Pump depth: 30.9 feet.

Volume Purged: 3.5 gallons; Rate of Purge: 0.25 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Light gray tint to water. After about 3.0 gallons, well was dry. Let recharge for 15 minutes and sampled. *(Did not get last readings because well went dry after sampling.)

Sampler: T. Sedosky
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-6-1996

Well No: MW-1B Sample Collection Time: 14:10

Well Total Depth: 55' Casing Head Elevation: 594.38

Depth to Water: 18.43 Elevation of Water Level: 575.95

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 36.57) x 3 =

Purge Volume 18.65 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 16.1 °C; pH 6.1 ; Sp. Conductance 445 µs.

Intermed: Temperature 16.2 °C; pH 4.9 ; Sp. Conductance 461 µs.

Final: Temperature 16.1 °C; pH 4.5 ; Sp. Conductance 468 µs.

Pump depth: 47 feet.

Volume Purged: 20 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody.

Comments: Initial water slightly medium cloudy. After 10 gallons, water was clear. At about 15 gallons, water clouded back up again.

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-6-1996

Well No: MW-1A Sample Collection Time: 14:15

Well Total Depth: 32' Casing Head Elevation: 594.37

Depth to Water: 18.32 Elevation of Water Level: 576.05

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 13.68) x 3 =

Purge Volume 6.97 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 15.9 °C; pH 5.7 ; Sp. Conductance 438 µs.

Intermed: Temperature 16.9 °C; pH 5.1 ; Sp. Conductance 442 µs.

Final: Temperature 17.1 °C; pH 5.0 ; Sp. Conductance 445 µs.

Pump depth: 31 feet.

Volume Purged: 8 gallons; Rate of Purge: 0.25 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Initial purge water was a deep red/orange stained water, after 4 gallons, cleared up a great deal. Still slight tint to water.

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON CORPORATION

Well Sampling Report

Well Location: Monsanto Performance Monitoring   Date: 12-6-1996

Well No: MW-24A   Sample Collection Time: 16:50

Well Total Depth: 35'   Casing Head Elevation: 594.58

Depth to Water: 24.92   Elevation of Water Level: 569.66

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 10.08) x 3 =

Purge Volume 19.35 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer X or Pump ____

Initial: Temperature 15.3 °C; pH 5.5 ; Sp. Conductance 900 µS.

Intermed: Temperature 14.3 °C; pH 6.4 ; Sp. Conductance 905 µS.

Final: Temperature ____ °C; pH 6.3 ; Sp. Conductance ____ µS.

Pump depth: N/A feet.

Volume Purged: 20 gallons; Rate of Purge: ____ gal/min.

Sample Protocol: See Chain-of-custody

Comments: Strong odor. Black water. (Respirator)

Sampler: T. Sedosky

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

TERRADON

P.O. Box 519
Nitro, WV 25143
(304) 755-8291
FAX 755-2636

Custody No. 2768

Date: 09-23-96

CHAIN-OF-CUSTODY RECORD

SAMPLE COLLECTION INFORMATION

Person to Contact: DAVE JUNKER Telephone: (304) 755-8291

Sampling Site: MONSANTO - FLEXSYS PLANT

Project #: 96x150.003 Sampler: TIM SIEDOSKY

Date of Sample Shipment: 9-23-96 How Shipped: PICKED UP

SAMPLE LOG AND ANALYSES REQUEST

TURNAROUND REQUIREMENTS
X Regular
___ Rush

Analysis Requested

Sample ID	Containers # and Type	Date	Time	Matrix	Grab / Comp.	TCE	BENZENE					Remarks
MW-20A	2-40mL (G)	9-20-96	0945	Liquid	G	X						
MW-20B	2-40mL (G)	9-20-96	0937	Liquid	G	X						
MW-23A	2-40mL (G)	9-20-96	1317	Liquid	G	X						
MW-14	2-40mL (G)	9-19-96	1710	Liquid	G		X					
MW-7	2-40mL (G)	9-20-96	1035	Liquid	G		X					
MW-22R	2-40mL (G)	9-19-96	1745	Liquid	G	X	X					
MW-24A	2-40mL (G)	9-20-96	1505	Liquid	G	X	X					

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Tim Siedosky	9-23-96 0900	[signature]			

Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Condition on Arrival
[signature]	9-23 410	[signature]	9/23 410	OK

Comments ____________________

Possible Interfering Compounds ____________________

Requested by ____________________

LAB I.D. NO. 43811

CONTINUED FROM #2767

ORIGINAL

TERRADON
P.O. Box 519
Nitro, WV 25143
(304) 755-8291
FAX 755-2636

Custody No. 2767

Date: 09-23-96

CHAIN-OF-CUSTODY RECORD

SAMPLE COLLECTION INFORMATION

Person to Contact DAVE Junker Telephone (304) 755-8291

Sampling Site MONSANTO - Flexsys PlANT

Project # 96X150.003 Sampler Tim SEDOSKY

Date of Sample Shipment 9-23-96 How Shipped PICKED-UP

SAMPLE LOG AND ANALYSES REQUEST

TURNAROUND REQUIREMENTS

X Regular

___ Rush

Analysis Requested

Sample ID	Containers # and Type	Date	Time	Matrix	Grab / Comp.	BENZENE	PHENOLS	TCE					Remarks
WT-15A	1-1L(G)	9-18-96	1700	Liquid	G	X	X						
WT-15A	2-40 mL(G)	9-18-96	1700	Liquid	G	X	X						
WT-14A	1-1L(G)	9-19-96	1123	Liquid	G	X	X						
WT-14A	2-40 mL(G)	9-19-96	1123	Liquid	G	X	X						
WT-13A	1-1L(G)	9-19-96	1400	Liquid	G	X	X						
WT-13A	2-40 mL(G)	9-19-96	1400	Liquid	G	X	X						
TD-5	1-1L(G)	9-19-96	0850	Liquid	G	X	X						
TD-5	2-40 mL(G)	9-19-96	0850	Liquid	G	X	X						
MW-1A	2-40 mL(G)	9-20-96	1220	Liquid	G			X					
MW-1B	2-40 mL(G)	9-20-96	1223	Liquid	G			X					
MW-5A	2-40 mL(G)	9-19-96	1927	Liquid	G			X					
MW-5B	2-40 mL(G)	9-19-96	1944	Liquid	G			X					

Relinquished by (Signature)	Date/Time	Received by (Signature)	Relinquished by (Signature)	Date/Time	Received by (Signature)
Tim Sedosky	9-23-96 0900	[signature]			

Relinquished by (Signature)	Date/Time	Received for Laboratory by (Signature)	Date/Time	Condition on Arrival
[signature]	9-23 4/10	[signature]	9/23 4/10	OK

Comments Phenolsby 8270 & Bill to Monsanto per Tim S.

Possible Interfering Compounds ___

Requested by ___

LAB I.D. NO. 45811

CONTINUED ON #2768

ORIGINAL

1ST QUARTER 1997

DRAFT

Quality Environmental Services

REIC Laboratory

Research, Environmental & Industrial Consultants, Inc.

P. O. Box 286 • Beaver, West Virginia 25813 • 1-304-255-2500
1-800-999-0105
FAX 1-304-255-2572

March 14, 1997

Mr. Tony Tuk
Monsanto Chemical
1 Monsanto Road
Nitro, WV 25143

R 17

RE: REIC Job #: 0397-49813

Dear Mr. Tuk:

Please find enclosed your analysis report for the samples submitted to our laboratory on March 6, 1997. Please note that the samples are identified as follows:

Site ID & State:	Monsanto-Flexsys Plant
Project ID:	96X150.003
Custody No.:	0419

Please do not hesitate to call if you have any questions.

Thank you.

Sincerely,

Ray Erickson

Ray Erickson
Assistant Laboratory Director

enclosure
RE/eb
cc: Dave Junker, Terradon

MONSANTO CHEMICAL
1 MONSANTO ROAD
NITRO, WV 25143

REIC JOB #: 0397-49813
SAMPLING SITE: MONSANTO-FLEXSYS PLANT
PROJECT ID: 96X150.003

Prepared By:
REIC LABORATORY
PO Box 286
Beaver WV 25813

TERRADON SAMPLE #: MW-20A **DATE SAMPLED:** 03-04-97
REIC SAMPLE #: 49813-1 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	2.05	mg/l	8240B	0.125	03-10-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	100
toluene-d8	97
4-bromofluorobenzene	98

MQL - Minimum Quantifying Level

TERRADON SAMPLE #: MW-20B
REIC SAMPLE #: 49813-2

DATE SAMPLED: 03-04-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	1.08	mg/l	8240B	0.125	03-10-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	100
toluene-d8	97
4-bromofluorobenzene	98

MQL - Minimum Quantifying Level

TERRADON SAMPLE #: MW-23A
REIC SAMPLE #: 49813-3

DATE SAMPLED: 03-04-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	1.29	mg/l	8240B	0.050	03-11-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	101
toluene-d8	98
4-bromofluorobenzene	98

MQL - Minimum Quantifying Level

TERRADON SAMPLE #: MW-14
REIC SAMPLE #: 49813-4

DATE SAMPLED: 03-04-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	ND	mg/l	8240B	0.005	03-11-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	103
toluene-d8	103
4-bromofluorobenzene	97

ND - None Detected at MQL
MQL - Minimum Quantifying Level

TERRADON SAMPLE #: MW-7
REIC SAMPLE #: 49813-5

DATE SAMPLED: 03-04-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	4.19	mg/l	8240B	0.250	03-12-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	101
toluene-d8	101
4-bromofluorobenzene	95

MQL - Minimum Quantifying Level

TERRADON SAMPLE #: MW-22R
REIC SAMPLE #: 49813-6

DATE SAMPLED: 03-03-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	0.019	mg/l	8240B	0.005	03-12-97/TC
benzene	0.015	mg/l	8240B	0.005	03-12-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	102
toluene-d8	101
4-bromofluorobenzene	100

MQL - Minimum Quantifying Level

TERRADON SAMPLE #: MW-24A
REIC SAMPLE #: 49813-7

DATE SAMPLED: 03-03-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	0.543	mg/l	8240B	0.005	03-13-97/TC
benzene	1.03	mg/l	8240B	0.005	03-13-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	96
toluene-d8	103
4-bromofluorobenzene	102

MQL - Minimum Quantifying Level

TERRADON SAMPLE #: TRIP BLANK **MATRIX:** LIQUID
REIC SAMPLE #: 49813-8

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	ND	mg/l	8240B	0.005	03-11-97/TC
benzene	ND	mg/l	8240B	0.005	03-11-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	103
toluene-d8	104
4-bromofluorobenzene	99

ND - None Detected at MQL
MQL - Minimum Quantifying Level

DATE 3-14-97

APPROVED [signature]
Ray Erickson

TERRADON
P.O. Box 519
Nitro, WV 25143
(304) 755-8291
FAX 755-2636

Custody No. 0419

Date: 3-5-97

CHAIN-OF-CUSTODY RECORD

SAMPLE COLLECTION INFORMATION

Person to Contact DAVE JUNKER Telephone 755-8291

Sampling Site MONSANTO - FLEXSIS PLANT

Project # 96X150.003 Sampler JB

Date of Sample Shipment 3-5-97 How Shipped PICKUP

SAMPLE LOG AND ANALYSES REQUEST

TURNAROUND REQUIREMENTS

X Regular

___ Rush

Sample ID	Containers # and Type	Date	Time	Matrix	Grab / Comp.	TCE	BENZENE					Remarks
MW-20A	2-40mL(6)	3/4/97	1110	H2O	GRAB	X						
MW-20B	2-40mL(6)	3/4/97	1035			X						
MW-23A	2-40mL(6)	3/4/97	1155			X						
MW-14	2-40mL(6)	3/4/97	1235				X					
MW-7	2-40mL(6)	3/4/97	930				X					
MW-22R	3-40mL(6)	3/3/97	1435			X	X					
MW-24A	2-40mL(6)	3/3/97	1515			X	X					
TRIP BLANK	1-40mL											
												4°C

Relinquished by (Signature)	Date/Time	Received by (Signature)	Relinquished by (Signature)	Date/Time	Received by (Signature)
J. J. Butler	[illegible]	Daniel Kelly	3/6/97 1100		
Relinquished by (Signature) Daniel Kelly	3/6/97 300	Received for Laboratory by (Signature) [illegible]	Date/Time 3/6 300	Condition on Arrival 4.0 °C	

Comments ~~[illegible]~~

Possible Interfering Compounds ORIGINAL REFER TO TOD TX - [illegible] DAVE JUNKER

Requested by ______

LAB I.D. NO. 49813

Quality Environmental Services

REIC Laboratory

Research, Environmental & Industrial Consultants, Inc.

P. O. Box 286 • Beaver, West Virginia 25813 • 1-304-255-2500
1-800-999-0105
FAX 1-304-255-2572

March 14, 1997

Mr. Tony Tuk
Monsanto Chemical
1 Monsanto Road
Nitro WV 25143

RE: REIC Job #: 0397-49815

Dear Mr. Tuk:

Please find enclosed your analysis report for the samples submitted to our laboratory on March 6, 1997. Please note that the samples are identified as follows:

Site ID & State:	Monsanto - Flexsys Plant
Project ID:	96x150.003
Custody No.:	2953

Please do not hesitate to call if you have any questions.

Thank you.

Sincerely,

Ray Erickson

Ray Erickson
Assistant Laboratory Director

enclosure
RE/eb
cc: Dave Junker, Terradon

MONSANTO COMPANY
THE CHEMICAL GROUP
1 MONSANTO DRIVE
NITRO WV 25143

REIC JOB #: 0397-49815
SITE ID & STATE: MONSANTO - FLEXSYS PLANT
PROJECT ID: 96x150.003
CUSTODY NO.: 2953

Prepared By:
REIC LABORATORY
PO Box 286
Beaver WV 25813

MONSANTO SAMPLE #: WT-15A **DATE SAMPLED: 03-03-97**
REIC SAMPLE #: 49815-1 **MATRIX: LIQUID**

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.006	mg/l	8240B	0.005	03-12-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	98
toluene-d8	98
4-bromofluorobenzene	97

SEMIVOLATILE ORGANIC COMPOUNDS/ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	03-12-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	03-12-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	03-12-97/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	03-12-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	03-12-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	03-12-97/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	03-12-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	03-12-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	03-12-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	03-12-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	03-12-97/WP
o-cresol	ND	mg/l	8270B	0.020	03-12-97/WP
m,p-cresol	ND	mg/l	8270B	0.020	03-12-97/WP

Surrogates	% Recovery
2-fluorophenol	55
phenol-d6	36
2,4,6-tribromophenol	74

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: WT-14A **DATE SAMPLED: 03-03-97**
REIC SAMPLE #: 49815-2 **MATRIX: LIQUID**

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.496	mg/l	8240B	0.005	03-12-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	97
toluene-d8	93
4-bromofluorobenzene	102

SEMIVOLATILE ORGANIC COMPOUNDS/ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	03-12-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	03-12-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	03-12-97/WP
2,4-dimethylphenol	0.032	mg/l	8270B	0.020	03-12-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	03-12-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	03-12-97/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	03-12-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	03-12-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	03-12-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	03-12-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	03-12-97/WP
o-cresol	0.062	mg/l	8270B	0.020	03-12-97/WP
m,p-cresol	ND	mg/l	8270B	0.020	03-12-97/WP

Surrogates	% Recovery
2-fluorophenol	57
phenol-d6	37
2,4,6-tribromophenol	64

ND - None Detected at MQL
MQL - Minimum Quantifying Level
* - Estimated level - Exceeds calibrated range

MONSANTO SAMPLE #: WT-13A
REIC SAMPLE #: 49815-3

DATE SAMPLED: 03-03-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.005	mg/l	8240B	0.005	03-12-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	98
toluene-d8	101
4-bromofluorobenzene	100

SEMIVOLATILE ORGANIC COMPOUNDS/ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	03-12-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	03-12-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	03-12-97/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	03-12-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	03-12-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	03-12-97/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	03-12-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	03-12-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	03-12-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	03-12-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	03-12-97/WP
o-cresol	ND	mg/l	8270B	0.020	03-12-97/WP
m,p-cresol	ND	mg/l	8270B	0.020	03-12-97/WP

Surrogates	% Recovery
2-fluorophenol	56
phenol-d6	38
2,4,6-tribromophenol	62

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: TD-5
REIC SAMPLE #: 49815-4
DATE SAMPLED: 03-03-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	ND	mg/l	8240B	0.005	03-11-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	103
toluene-d8	101
4-bromofluorobenzene	98

SEMIVOLATILE ORGANIC COMPOUNDS/ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	03-12-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	03-12-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	03-12-97/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	03-12-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	03-12-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	03-12-97/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	03-12-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	03-12-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	03-12-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	03-12-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	03-12-97/WP
o-cresol	ND	mg/l	8270B	0.020	03-12-97/WP
m,p-cresol	ND	mg/l	8270B	0.020	03-12-97/WP

Surrogates	% Recovery
2-fluorophenol	55
phenol-d6	37
2,4,6-tribromophenol	65

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-1A
REIC SAMPLE #: 49815-5

DATE SAMPLED: 03-04-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	0.008	mg/l	8240B	0.005	03-11-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	102
toluene-d8	100
4-bromofluorobenzene	97

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-1B **DATE SAMPLED: 03-04-97**
REIC SAMPLE #: 49815-6 **MATRIX: LIQUID**

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	0.010	mg/l	8240B	0.005	03-11-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	104
toluene-d8	104
4-bromofluorobenzene	97

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-5A
REIC SAMPLE #: 49815-7

DATE SAMPLED: 03-04-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	1.45	mg/l	8240B	0.005	03-12-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	98
toluene-d8	97
4-bromofluorobenzene	98

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: **MW-5B**
REIC SAMPLE #: **49815-8**

DATE SAMPLED: **03-03-97**
MATRIX: **LIQUID**

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	2.33	mg/l	8240B	0.005	03-12-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	99
toluene-d8	101
4-bromofluorobenzene	95

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: TRIP BLANK **MATRIX:** LIQUID
REIC SAMPLE #: 49815-9

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	ND	mg/l	8240B	0.005	03-11-97/TC
benzene	ND	mg/l	8240B	0.005	03-11-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	101
toluene-d8	101
4-bromofluorobenzene	98

ND - None Detected at MQL
MQL - Minimum Quantifying Level

DATE 3-14-97 APPROVED [signature]
Ray Erickson

TERRADON
P.O. Box 519
Nitro, WV 25143
(304) 755-8291
FAX 755-2636

Custody No. 2953

Date: 3-6-97

CHAIN-OF-CUSTODY RECORD

SAMPLE COLLECTION INFORMATION

Person to Contact DAVE JUNKER Telephone (304) 755-8291

Sampling Site MONSANTO - FLEXSYS PLANT

Project # 96X150.003 Sampler JEFF BUTLER

Date of Sample Shipment 3-6-97 How Shipped PICKED UP

SAMPLE LOG AND ANALYSES REQUEST

TURNAROUND REQUIREMENTS
X Regular
___ Rush

Analysis Requested

Sample ID	Containers # and Type	Date	Time	Matrix	Grab / Comp.	BENZENE	PHENOLS	TCE				Remarks
WT-15A	1-1L (6)	3/3/97	1300	H_2O	GRAB	X	X					
T-15A	2-40mL (6)	3/3/97	1300	H_2O	GRAB	X	X					
WT-14A	1-1L (6)	3/3/97	1130	H_2O	GRAB	X	X					
WT-14A	2-40mL (6)	3/3/97	1130	H_2O	GRAB	X	X					
WT-13A	1-1L (6)	3/3/97	1345	H_2O	GRAB	X	X					
WT-13A	2-40mL (6)	3/3/97	1345	H_2O	GRAB	X	X					
TD-5	1-1L (6)	3/3/97	1045	H_2O	GRAB	X	X					
TD-5	2-40mL (6)	3/3/97	1045	H_2O	GRAB	X	X					4°C
MW-1A	2-40mL (6)	3/4/97	1415	H_2O	GRAB			X				
MW-1B	2-40mL (6)	3/4/97	1315	H_2O	GRAB			X				
MW-5A	2-40mL (6)	3/4/97	0955	H_2O	GRAB			X				
MW-5B	2-40mL (6)	3/3/97	1615	H_2O	GRAB			X				

Relinquished by (Signature)	Date/Time	Received by (Signature)	Relinquished by (Signature)	Date/Time	Received by (Signature)
Jeff Butler	12/4/97 1100	[signature]	3/6/97 1100		

Relinquished by (Signature)	Date/Time	Received for Laboratory by (Signature)	Date/Time	Condition on Arrival
[signature]	3/6/97 300	[signature]	3/6 300	OK

Comments FOR PHENOLS: STANDARD PHENOLICS LIST PLUS O-CRESOL AND M,P-CRESOL
DIRECT BILLING TO MONSANTO ATTN: TONY TUK

Possible Interfering Compounds ORIGINAL REPORT TO TONY TUK - COPY TO DAVE JUNKER

Requested by ______

LAB I.D. NO. 49815

POTESTA & ASSOCIATES

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 3-4-97

Well No: MW-1A Sample Collection Time: 14:15

Well Total Depth: 32' Casing Head Elevation: 594.37

Depth to Water: 18.48 Elevation of Water Level: 575.89

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 13.52) x 3 =

Purge Volume 6.97 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 13.4 °C; pH 6.4 ; Sp. Conductance 575 µs.

Intermed: Temperature 13.9 °C; pH 5.8 ; Sp. Conductance 588 µs.

Final: Temperature ______ °C; pH ______; Sp. Conductance ______ µs.

Pump depth: 30 feet.

Volume Purged: 8 gallons; Rate of Purge: 0.75 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Initial purge water was reddish brown in color.

Sampler: J. Butler

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

POTESTA & ASSOCIATES

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 3-4-97

Well No: MW-1B Sample Collection Time: 1315

Well Total Depth: 55' Casing Head Elevation: 594.38

Depth to Water: 18.55 Elevation of Water Level: 575.83

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 36.5) x 3 =

Purge Volume 18.6 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 14.4 °C; pH 6.84 ; Sp. Conductance 694 µs.

Intermed: Temperature 14.1 °C; pH 6.4 ; Sp. Conductance 714 µs.

Final: Temperature 14.0 °C; pH 6.0 ; Sp. Conductance 766 µs.

Pump depth: 39 feet.

Volume Purged: 20 gallons; Rate of Purge: 0.75 gal/min.

Sample Protocol: See Chain-of-Custody.

Comments: 0-12 gallons slightly cloudy

Sampler: J. Butler

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 3-3-97

Well No: MW-5B Sample Collection Time: 1615

Well Total Depth: 56' Casing Head Elevation: 594.91

Depth to Water: 24.65' Elevation of Water Level: 570.26

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 31.4) x 3 =

Purge Volume 15.9 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 17.9 °C; pH 6.9 ; Sp. Conductance 1024 µs.

Intermed: Temperature 18.3 °C; pH 6.6 ; Sp. Conductance 984 µs.

Final: Temperature 18.4 °C; pH 6.4 ; Sp. Conductance 1266 µs.

Pump depth: 38 feet.

Volume Purged: 17 gallons; Rate of Purge: 0.75 gal/min.

Sample Protocol: See Chain-of-Custody

Comments:

Sampler: J. Butler

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 3-4-97

Well No: MW-5A Sample Collection Time: 0955

Well Total Depth: 33' Casing Head Elevation: 594.65

Depth to Water: 24.40 Elevation of Water Level: 570.25

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 8.6) x 3 =

Purge Volume 4.4 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 19.1 °C; pH 5.8 ; Sp. Conductance 850 μs.

Intermed: Temperature 19.0 °C; pH 5.7 ; Sp. Conductance 748 μs.

Final: Temperature 19.4 °C; pH 5.5 ; Sp. Conductance 890 μs.

Pump depth: 31.0 feet.

Volume Purged: 5.0 gallons; Rate of Purge: 0.75 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Brownish color

Sampler: J. Butler

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 3-4-97

Well No: MW-7 Sample Collection Time: 0930

Well Total Depth: 30' Casing Head Elevation: 594.03

Depth to Water: 25.72 Elevation of Water Level: 568.31

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 4.3) x 3 =

Purge Volume 2.2 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer X or Pump ____

Initial: Temperature 13.5 °C; pH 7.0 ; Sp. Conductance 848 µS.

Intermed: Temperature 13.7 °C; pH 6.7 ; Sp. Conductance 752 µS.

Final: Temperature ____ °C; pH ____; Sp. Conductance ____ µS.

Pump depth: N/A feet.

Volume Purged: 2.5 gallons; Rate of Purge: 0.25 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Strong kerosene smell

Sampler: J. Butler

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 3-3-97

Well No: WT-13A Sample Collection Time: 1345

Well Total Depth: 35.06 Casing Head Elevation: 590.82

Depth to Water: 22.24 Elevation of Water Level: 568.34

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 12.8) x 3 =

Purge Volume 24.6 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 13.8 °C; pH 5.3 ; Sp. Conductance 1760 µs.

Intermed: Temperature 14.0 °C; pH 5.1 ; Sp. Conductance 1640 µs.

Final: Temperature 14.1 °C; pH 5.2 ; Sp. Conductance 1620 µs.

Pump depth: 34.0 feet.

Volume Purged: 25 gallons; Rate of Purge: 0.75 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Purge water 0 gallons to 10 gallons -brownish-red color.

Sampler: J. Butler
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 3-4-97

Well No: MW-14 Sample Collection Time: 1235

Well Total Depth: 29' Casing Head Elevation: 589.53

Depth to Water: 15.35 Elevation of Water Level: 574.27

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 13.6) x 3 =

Purge Volume 7.0 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 12.8 °C; pH 7.3 ; Sp. Conductance 303 µs.

Intermed: Temperature 13.0 °C; pH 6.8 ; Sp. Conductance 312 µs.

Final: Temperature 13.1 °C; pH 6.5 ; Sp. Conductance 305 µs.

Pump depth: 27 feet.

Volume Purged: 8.0 gallons; Rate of Purge: 0.75 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Water slight brown

Sampler: J. Butler

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 3-3-97

Well No: WT-14A Sample Collection Time: 1130

Well Total Depth: 35.43 Casing Head Elevation: 593.57

Depth to Water: 21.52 Elevation of Water Level: 572.05

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 13.91) x 3 =

Purge Volume 26.71 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 13.4 °C; pH 8.3 ; Sp. Conductance 1360μs.

Intermed: Temperature 13.2 °C; pH 8.5 ; Sp. Conductance 1340μs.

Final: Temperature 13.3 °C; pH 8.4 ; Sp. Conductance 1340μs.

Pump depth: 31 feet. (Because of bailer)

Volume Purged: 27 gallons; Rate of Purge: 1.0 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Blue-green tint to water

Sampler: J. Butler

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 3-3-97

Well No: WT-15A Sample Collection Time: 1300

Well Total Depth: 24.87 Casing Head Elevation: 589.08

Depth to Water: 6.83 Elevation of Water Level: 582.25

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 18.04) x 3 =

Purge Volume 34.6 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 12.4 °C; pH 8.3 ; Sp. Conductance 708 µS.

Intermed: Temperature 12.5 °C; pH 6.9 ; Sp. Conductance 694 µS.

Final: Temperature 11.9 °C; pH 6.3 ; Sp. Conductance 7.25 µS.

Pump depth: 23 feet.

Volume Purged: 35 gallons; Rate of Purge: 1.0 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Initial purge orange color with strong phenol odor.

Sampler: J. Butler - TERRADON

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

POTESTA & ASSOCIATES

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 3-4-97

Well No: MW-20A Sample Collection Time: 1110

Well Total Depth: 40' Casing Head Elevation: 596.71

Depth to Water: 26.45 Elevation of Water Level: 570.26

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 13.5) x 3 =

Purge Volume 6.9 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 16.5 °C; pH 6.6 ; Sp. Conductance 880 μs.

Intermed: Temperature 14.9 °C; pH 6.8 ; Sp. Conductance 725 μs.

Final: Temperature 16.9 °C; pH 6.9 ; Sp. Conductance 694 μs.

Pump depth: 35 feet.

Volume Purged: 3.75 gallons; Rate of Purge: 0.25 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Well went dry after 3 gallons, let recharge and took final readings and sample. cloudy water w/slight odor.

Sampler: J. Butler
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 3-4-97

Well No: MW-20B Sample Collection Time: 1035

Well Total Depth: 57' Casing Head Elevation: 596.76

Depth to Water: 26.47' Elevation of Water Level: 570.29

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 30.50) x 3 =

Purge Volume 15.50 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 15.5 °C; pH 6.82 ; Sp. Conductance 4.82ms.

Intermed: Temperature 16.8 °C; pH 6.7 ; Sp. Conductance 5.05ms.

Final: Temperature 17.1 °C; pH 6.65 ; Sp. Conductance 6.1 ms.

Pump depth: 38 feet.

Volume Purged: 17 gallons; Rate of Purge: 0.75 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Dark brown color, could not get frothy air bubbles out of sample vials.

Sampler: J. Butler

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 3-3-97

Well No: MW-22R Sample Collection Time: 1435

Well Total Depth: 40.0 Casing Head Elevation: 596.53

Depth to Water: 27.30 Elevation of Water Level: 569.23

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 12.7) x 3 =

Purge Volume 24.4 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 15.8 °C; pH 6.0 ; Sp. Conductance 645 μs.

Intermed: Temperature 16.0 °C; pH 6.2 ; Sp. Conductance 483 μs.

Final: Temperature 16.1 °C; pH 6.3 ; Sp. Conductance 680 μs.

Pump depth: 38.0 feet.

Volume Purged: 25 gallons; Rate of Purge: 1.0 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Initial purge water gray tinted.

Sampler: J. Butler

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 3-4-97

Well No: MW-23A Sample Collection Time: 1155

Well Total Depth: 35 Casing Head Elevation: 598.82

Depth to Water: 27.07 Elevation of Water Level: 571.75

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 7.92) x 3 =

Purge Volume 15.20 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 13.8 °C; pH 6.7 ; Sp. Conductance 800 µS.

Intermed: Temperature 13.5 °C; pH 6.67; Sp. Conductance 760 µS.

Final: Temperature 13.4 °C; pH 6.05; Sp. Conductance 810 µS.

Pump depth: 33 feet.

Volume Purged: 7.5 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Slight odor, purged well dry (6.5 gallons), let recharge and took final readings and sampled.

Sampler: J. Butler

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTEATA & ASSOCIATES

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 3-3-97

Well No: MW-24A Sample Collection Time: 1515

Well Total Depth: 35' Casing Head Elevation: 594.58

Depth to Water: 24.90 Elevation of Water Level: 569.68

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 10.1) x 3 =

Purge Volume 19.4 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ___ or Pump x

Initial: Temperature 15.9 °C; pH 6.3 ; Sp. Conductance 1300 μS.

Intermed: Temperature 15.8 °C; pH 6.6 ; Sp. Conductance 1271 μS.

Final: Temperature 16.0 °C; pH 6.2 ; Sp. Conductance 1150 μS.

Pump depth: 33 feet.

Volume Purged: 20 gallons; Rate of Purge: 1.0 gal/min.

Sample Protocol: See Chain-of-custody

Comments: Water black in color used respirator.

Sampler: J. Butler

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 3-3-97

Well No: TD-5 Sample Collection Time: 1045

Well Total Depth: 30.40 Casing Head Elevation: 589.49

Depth to Water: 18.11 Elevation of Water Level: 571.38

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 9.55) x 3 =

Purge Volume 4.87 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 13.2 °C; pH 6.24; Sp. Conductance 1970 µs.

Intermed: Temperature 13.4 °C; pH 6.0 ; Sp. Conductance 1900 µs.

Final: Temperature 13.6 °C; pH 6.1 ; Sp. Conductance 1888 µs.

Pump depth: 29.0 feet.

Volume Purged: 8 gallons; Rate of Purge: 0.75 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Water has light brown/orange tint to it.

Sampler: J. Butler

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64; 5" = 1.02

2ND QUARTER 1997

DRAFT

MONSANTO COMPANY
1 MONSANTO ROAD
NITRO WV 25143

REIC JOB #: 0697-52527
SITE ID: MONSANTO/FLEXSYS PLANT
PROJECT ID: 97075.001
CUSTODY NO.'S: 40907 & 51430

Prepared By:
REIC LABORATORY
P O Box 286
Beaver WV 25813

MONSANTO SAMPLE #: TD-5
REIC SAMPLE #: 52527-4

DATE SAMPLED: 06-17-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	ND	mg/l	8240B	0.005	06-20-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	97
toluene-d8	102
4-bromofluorobenzene	101

SEMIVOLATILE ORGANIC COMPOUNDS/ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	06-21-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	06-21-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	06-21-97/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	06-21-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	06-21-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	06-21-97/WP
2,4,6-trichlorophenol	0.186	mg/l	8270B	0.020	06-21-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	06-21-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	06-21-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	06-21-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	06-21-97/WP
o-cresol	ND	mg/l	8270B	0.020	06-21-97/WP
m,p-cresol	ND	mg/l	8270B	0.040	06-21-97/WP

Surrogates	% Recovery
2-fluorophenol	43
phenol-d6	29
2,4,6-tribromophenol	72

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: WT-15A
REIC SAMPLE #: 52527-1

DATE SAMPLED: 06-17-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.007	mg/l	8240B	0.005	06-20-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	103
toluene-d8	102
4-bromofluorobenzene	102

SEMIVOLATILE ORGANIC COMPOUNDS/ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	06-21-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	06-21-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	06-21-97/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	06-21-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	06-21-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	06-21-97/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	06-21-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	06-21-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	06-21-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	06-21-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	06-21-97/WP
o-cresol	ND	mg/l	8270B	0.020	06-21-97/WP
m,p-cresol	ND	mg/l	8270B	0.040	06-21-97/WP

Surrogates	% Recovery
2-fluorophenol	42
phenol-d6	34
2,4,6-tribromophenol	76

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: WT-14A
REIC SAMPLE #: 52527-2
DATE SAMPLED: 06-17-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.930	mg/l	8240B	0.050	06-23-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	107
toluene-d8	100
4-bromofluorobenzene	108

SEMIVOLATILE ORGANIC COMPOUNDS/ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	0.509	mg/l	8270B	0.020	06-21-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	06-21-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	06-21-97/WP
2,4-dimethylphenol	0.058	mg/l	8270B	0.020	06-21-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	06-21-97/WP
4-chloro-3-methylphenol	0.206	mg/l	8270B	0.020	06-21-97/WP
2,4,6-trichlorophenol	0.134	mg/l	8270B	0.020	06-21-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	06-21-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	06-21-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	06-21-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	06-21-97/WP
o-cresol	0.383	mg/l	8270B	0.020	06-21-97/WP
m,p-cresol	10.4	mg/l	8270B	0.040	06-21-97/WP

Surrogates	% Recovery
2-fluorophenol	38
phenol-d6	31
2,4,6-tribromophenol	70

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: WT-13A
REIC SAMPLE #: 52527-3

DATE SAMPLED: 06-17-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	ND	mg/l	8240B	0.005	06-21-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	102
toluene-d8	101
4-bromofluorobenzene	103

SEMIVOLATILE ORGANIC COMPOUNDS/ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	06-21-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	06-21-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	06-21-97/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	06-21-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	06-21-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	06-21-97/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	06-21-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	06-21-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	06-21-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	06-21-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	06-21-97/WP
o-cresol	ND	mg/l	8270B	0.020	06-21-97/WP
m,p-cresol	ND	mg/l	8270B	0.040	06-21-97/WP

Surrogates	% Recovery
2-fluorophenol	40
phenol-d6	27
2,4,6-tribromophenol	78

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-1A **DATE SAMPLED:** 06-16-97
REIC SAMPLE #: 52527-5 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	ND	mg/l	8240B	0.005	06-20-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	84
toluene-d8	102
4-bromofluorobenzene	103

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-1B
REIC SAMPLE #: 52527-6

DATE SAMPLED: 06-16-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	ND	mg/l	8240B	0.005	06-23-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	86
toluene-d8	96
4-bromofluorobenzene	114

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-5A
REIC SAMPLE #: 52527-7

DATE SAMPLED: 06-17-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	1.04	mg/l	8240B	0.005	06-24-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	107
toluene-d8	96
4-bromofluorobenzene	105

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-5B
REIC SAMPLE #: 52527-8

DATE SAMPLED: 06-17-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	1.68	mg/l	8240B	0.005	06-24-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	102
toluene-d8	99
4-bromofluorobenzene	103

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-20A
REIC SAMPLE #: 52527-9

DATE SAMPLED: 06-16-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	7.73	mg/l	8240B	0.005	06-24-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	103
toluene-d8	98
4-bromofluorobenzene	101

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-20B
REIC SAMPLE #: 52527-10

DATE SAMPLED: 06-16-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	1.16	mg/l	8240B	0.050	06-24-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	104
toluene-d8	99
4-bromofluorobenzene	101

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-23A **DATE SAMPLED:** 06-16-97
REIC SAMPLE #: 52527-11 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	2.52	mg/l	8240B	0.005	06-26-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	104
toluene-d8	98
4-bromofluorobenzene	96

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-14 **DATE SAMPLED:** 06-17-97
REIC SAMPLE #: 52527-12 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	ND	mg/l	8240B	0.005	06-24-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	83
toluene-d8	102
4-bromofluorobenzene	101

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-7 **DATE SAMPLED:** 06-17-97
REIC SAMPLE #: 52527-13 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	4.33	mg/l	8240B	0.050	06-24-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	103
toluene-d8	99
4-bromofluorobenzene	102

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-22R
REIC SAMPLE #: 52527-14

DATE SAMPLED: 06-17-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.011	mg/l	8240B	0.005	06-24-97/TC
trichloroethene	0.005	mg/l	8240B	0.005	06-24-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	99
toluene-d8	105
4-bromofluorobenzene	101

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-24A
REIC SAMPLE #: 52527-15

DATE SAMPLED: 06-17-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.934	mg/l	8240B	0.250	06-24-97/TC
trichloroethene	0.431	mg/l	8240B	0.250	06-24-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	101
toluene-d8	85
4-bromofluorobenzene	86

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: TRIP BLANK **MATRIX:** LIQUID
REIC SAMPLE #: 52527-16

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	ND	mg/l	8240B	0.005	06-24-97/TC
trichloroethene	ND	mg/l	8240B	0.005	06-24-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	101
toluene-d8	101
4-bromofluorobenzene	106

ND - None Detected at MQL
MQL - Minimum Quantifying Level

DATE 6-30-97

APPROVED Ray Erickson
Ray Erickson

REIC Laboratory
225 Industrial Park Rd.
P.O. Box 286, Beaver, WV 25813
Phone: 304-255-2500 or 800-999-0105
FAX: 304-255-2572

CHAIN OF CUSTODY RECORD NO. 4090

CLIENT: MONSANTO COMPANY
ADDRESS: 1 MONSANTO ROAD
CITY/STATE/ZIP: NITRO, WV 25143
BILL TO: MONSANTO COMPANY
CITY/STATE/ZIP: NITRO, WV 25143

CONTACT PERSON: DAVE JUNKER
TELEPHONE/FAX: (304) 357-4490/4988
SITE ID & STATE: MONSANTO/FLEXSYS PLANT
PROJECT ID: 97075.001
SAMPLER: D. STOTTLEMYER

SAMPLE LOG AND ANALYSIS REQUEST

TURNAROUND TIME REQUIREMENTS
REGULAR: X
*RUSH: ___ 5-Day ___ 3-Day ___ 2-Day ___ 1-Day
*Rush work needs prior Laboratory approval and will include surcharges

PRESERVATIVES
0 No Preservative
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide
6 Zinc Acetate
7 EDTA

ANALYSIS REQUESTED & METHOD — PRESERVATIVE CODES: BENZENE 1, PHENOLS 0, TCE 1

SAMPLE ID	NO. & TYPE OF CONTAINERS	SAMPLING DATE / TIME	MATRIX	SAMPLE COMP / GRAB	BENZENE	PHENOLS	TCE	COMMENTS
WT-15A	1-1L (6)	6-17-97 1130	H_2O	GRAB	X	X		TRIC
WT-15A	2-40 ml	6-17-97 1130	H_2O	GRAB	X	X		
WT-14A	1-1L (6)	6-17-97 1025	H_2O	GRAB	X	X		
WT-14A	2-40 ml	6-17-97 1025	H_2O	GRAB	X	X		
WT-13A	1-1L (6)	6-17-97 1050	H_2O	GRAB	X	X		
WT-13A	2-40 ml	6-17-97 1050	H_2O	GRAB	X	X		4°C
TD-5	1-1L (6)	6-17-97 1000	H_2O	GRAB	X	X		
TD-5	2-40 ml	6-17-97 1000	H_2O	GRAB	X	X		
MW-1A	2-40 ml	6-16-97 1400	H_2O	GRAB			X	
MW-1B	2-40 ml	6-16-97 1342	H_2O	GRAB			X	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
		[signature]	6/18/97	[signature]	6/18/97	[signature]	6-19-97 10:32

Special Requests: 4.0°C

Shipment: Hand Del: Courier: UPS FedEx Shipment Date: FAX Results: Y N

REIC

CHAIN OF CUSTODY RECORD NO. 51430

REIC Laboratory
225 Industrial Park Rd.
P.O. Box 286, Beaver, WV 25813
Phone: 304-255-2500 or 800-999-0105
FAX: 304-255-2572

CLIENT: MONSANTO COMPANY
ADDRESS: 1 MONSANTO ROAD
CITY/STATE/ZIP: NITRO, WV 25143
BILL TO: MONSANTO COMPANY
CITY/STATE/ZIP: NITRO, WV 25143

CONTACT PERSON: DAVE JUNKER
TELEPHONE/FAX: (304) 357-4990/4998
SITE ID & STATE: MONSANTO/FLEXSYS PLANT
PROJECT ID: 97075.001
SAMPLER: D. STOTTLEMYER

SAMPLE LOG AND ANALYSIS REQUEST

TURNAROUND TIME REQUIREMENTS
REGULAR: X
*RUSH: ___ 5-Day ___ 3-Day ___ 2-Day ___ 1-Day
*Rush work needs prior Laboratory approval and will include surcharges

PRESERVATIVES
0 No Preservative
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide
6 Zinc Acetate
7 EDTA

PRESERVATIVE CODES
NOTE PRESERVATIVES → 1 | 0 | 1

ANALYSIS REQUESTED & METHOD

SAMPLE ID	NO. & TYPE OF CONTAINERS	SAMPLING DATE / TIME	MATRIX	SAMPLE COMP / GRAB	BENZENE (1)	PHENOLS (0)	TCE (1)	COMMENTS
MW-5A	2-40 ml	6-17-97 0800	H_2O	GRAB			X	
MW-5B	2-40 ml	6-17-97 0823	H_2O	GRAB			X	
MW-20A	2-40 ml	6-16-97 1558	H_2O	GRAB			X	
MW-20B	2-40 ml	6-16-97 1535	H_2O	GRAB			X	
MW-23A	2-40 ml	6-16-97 1449	H_2O	GRAB			X	YK
MW-14	2-40 ml	6-17-97 0923	H_2O	GRAB	X			
MW-7	3-40 ml	6-17-97 1158	H_2O	GRAB	X			
MW-22R	3-40 ml	6-17-97 1312	H_2O	GRAB	X		X	
MW-24A	3-40 ml	6-17-97 1430	H_2O	GRAB	X		X	
TRIP BLANK	1-40 ml		H_2O					

Relinquished by: (Signature) | Date/Time | Received by: (Signature) [signature] | Date/Time 6/18/97 | Relinquished by: (Signature) [signature] | Date/Time 6/18/97 | Received by: (Signature) [signature] | Date/Time 6-19-97 10:30

Special Requests:
Sample Condition: Good? Y N
Temperature Upon Arrival 4.0 °C OK

Shipment: Hand-Out: Courier: UPS: FedEx:
Shipment Date: FAX Results: Y N

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 6- 16 -97

Well No: MW-1A Time Sample Taken: 14:00

Well Total Depth: 32.0 Casing Head Elevation: 594.37

Depth to Water: 18.63 Elevation of Water Level: 575.74

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 13.37) x 3 =

Purge Volume 6.82 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 19.2 °C; pH 6.29 ; Sp. Conductance 350 µS.

Intermed: Temperature 17.0 °C; pH 6.50 ; Sp. Conductance 430 µS.

Final: Temperature 16.0 °C; pH 8.40 ; Sp. Conductance 460 µS.

Pump\bailer depth: 20.0 feet.

Volume Purged: 10.0 gallons; Rate of Purge: 2.0 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Initially rusty-orange; cleaned up quickly.

Sampler: D. Stottlemyer
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 6- 16 -97

Well No: MW-1B Time Sample Taken: 13:42

Well Total Depth: 55.0 Casing Head Elevation: 594.38

Depth to Water: 18.70 Elevation of Water Level: 575.68

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 36.3) x 3 =

Purge Volume 18.51 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 18.6 °C; pH 6.70 ; Sp. Conductance 390 µS.

Intermed: Temperature 17.8 °C; pH 6.03 ; Sp. Conductance 400 µS.

Final: Temperature 18.0 °C; pH 5.89 ; Sp. Conductance 430 µS.

Pump\bailer depth: 30.0 feet.

Volume Purged: 20.0 gallons; Rate of Purge: 2.0 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Initially clear-became slightly murky.

Sampler: D. Stottlemyer
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 6- 16 -97

Well No: MW-5A Time Sample Taken: 8:00

Well Total Depth: 33.0 Casing Head Elevation: 594.65

Depth to Water: 25.58 Elevation of Water Level: 569.07

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 7.42) x 3 =

Purge Volume 3.78 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 20.1 °C; pH 6.22 ; Sp. Conductance 770 µS.

Intermed: Temperature 20.0 °C; pH 6.48 ; Sp. Conductance 570 µS.

Final: Temperature 20.1 °C; pH 6.30 ; Sp. Conductance 640 µS.

Pump\bailer depth: 32.0 feet.

Volume Purged: 4.0 gallons; Rate of Purge: 2.0 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Began murky-purged clean.

Sampler: D. Stottlemyer
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 6- 16 -97

Well No: MW-5B Time Sample Taken: 8:23

Well Total Depth: 56.0 Casing Head Elevation: 594.91

Depth to Water: 25.61 Elevation of Water Level: 569.30

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 30.39) x 3 =

Purge Volume 15.50 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 19.6 °C; pH 8.13 ; Sp. Conductance 1800 µS.

Intermed: Temperature 19.6 °C; pH 7.51 ; Sp. Conductance 1820 µS.

Final: Temperature 19.6 °C; pH 8.91 ; Sp. Conductance 1700 µS.

Pump\bailer depth: 45.0 feet.

Volume Purged: 16.0 gallons; Rate of Purge: 2.0 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Began murky.

Sampler: D. Stottlemyer
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 6- 17 -97

Well No: MW-7 Time Sample Taken: 13:58

Well Total Depth: 30.00 Casing Head Elevation: 594.03

Depth to Water: 28.20 Elevation of Water Level: 565.83

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 1.8) x 3 =

Purge Volume 0.92 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature -- °C; pH -- ; Sp. Conductance -- µS.

Intermed: Temperature -- °C; pH -- ; Sp. Conductance -- µS.

Final: Temperature 21.5 °C; pH 6.88 ; Sp. Conductance 390 µS.

Pump\bailer depth: 29.5 feet.

Volume Purged: 3.0 gallons; Rate of Purge: ______ gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Bailed ~ 18" of kerosene off of top. Sampled with whale pump.

Sampler: D. Stottlemyer
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 6- 17 -97

Well No: MW-14 Time Sample Taken: 9:23

Well Total Depth: 35.43 Casing Head Elevation: 593.57

Depth to Water: 15.74 Elevation of Water Level: 577.83

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 19.69) x 3 =

Purge Volume 10.04 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 15.2 °C; pH 9.13 ; Sp. Conductance 250 µS.

Intermed: Temperature 14.8 °C; pH 9.36 ; Sp. Conductance 220 µS.

Final: Temperature 14.4 °C; pH 7.80 ; Sp. Conductance 210 µS.

Pump\bailer depth: 28.0 feet.

Volume Purged: 12.0 gallons; Rate of Purge: 2.0 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Murky purge water. ~ 4' subsidence 10' SE of MW-14.

Purge water cleared up.

Sampler: D. Stottlemyer
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 6- 16 -97

Well No: MW-20A Time Sample Taken: 15:58

Well Total Depth: 40.00 Casing Head Elevation: 596.71

Depth to Water: 27.32 Elevation of Water Level: 569.39

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 12.68) x 3 =

Purge Volume 6.47 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 20.6 °C; pH 7.50 ; Sp. Conductance 950 µS.

Intermed: Temperature ______ °C; pH ______; Sp. Conductance ______ µS.

Final: Temperature 19.8 °C; pH 6.46 ; Sp. Conductance 600 µS.

Pump\bailer depth: 39.0 feet.

Volume Purged: ________ gallons; Rate of Purge: ________ gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Purged 2 gallons of clear water & ran out of water.

Waited 10 minutes, purged 2.0 gallons of dark water & sampled.

Sampler: D. Stottlemyer
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 6- 16 -97

Well No: MW-20B Time Sample Taken: 15:35

Well Total Depth: 57.01 Casing Head Elevation: 596.76

Depth to Water: 27.35 Elevation of Water Level: 569.41

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 29.66) x 3 =

Purge Volume 15.12 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 20.7 °C; pH 6.48 ; Sp. Conductance 860 µS.

Intermed: Temperature 20.1 °C; pH 7.09 ; Sp. Conductance 3110 µS.

Final: Temperature 20.5 °C; pH 7.07 ; Sp. Conductance 2910 µS.

Pump\bailer depth: 45.0 feet.

Volume Purged: 20.0 gallons; Rate of Purge: 2.0 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Purge water started clear, turned coffee color with a urea odor and white froth. Bubbles could not be removed.

Sampler: D. Stottlemyer
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 6- 17 -97

Well No: MW-22R Time Sample Taken: 13:12

Well Total Depth: 40.0 Casing Head Elevation: 596.76

Depth to Water: 28.81 Elevation of Water Level: 567.72

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 11.19) x 3 =

Purge Volume 21.49 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 18.3 °C; pH 6.52 ; Sp. Conductance 710 µS.

Intermed: Temperature 18.1 °C; pH 6.57 ; Sp. Conductance 740 µS.

Final: Temperature 18.6 °C; pH 6.70 ; Sp. Conductance 660 µS.

Pump\bailer depth: 39.0 feet.

Volume Purged: 18.0 gallons; Rate of Purge: 1.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Purge water dirty with very fine sand. Had to wait for recharge to sample.

Sampler: D. Stottlemyer
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 6- 16 -97

Well No: MW-23A Time Sample Taken: 14:49

Well Total Depth: 35.0 Casing Head Elevation: 598.82

Depth to Water: 27.92 Elevation of Water Level: 570.90

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 7.08) x 3 =

Purge Volume 13.60 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 16.8 °C; pH 7.11 ; Sp. Conductance 820 μS.

Intermed: Temperature 16.8 °C; pH 7.06 ; Sp. Conductance 980 μS.

Final: Temperature 17.5 °C; pH 6.65 ; Sp. Conductance 970 μS.

Pump\bailer depth: 34.0 feet.

Volume Purged: 7.0 gallons; Rate of Purge: 2.0 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Well ran dry after 5 gallons. Waited 10 minutes, purged 2 more gallons and sampled.

Sampler: D. Stottlemyer
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 6- 17 -97

Well No: MW-24A Time Sample Taken: 14:30

Well Total Depth: 35.0 Casing Head Elevation: 594.58

Depth to Water: 26.32 Elevation of Water Level: 568.26

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 8.68) x 3 =

Purge Volume 16.67 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 17.9 °C; pH 6.84 ; Sp. Conductance 870 µS.

Intermed: Temperature 18.8 °C; pH 7.41 ; Sp. Conductance 550 µS.

Final: Temperature 18.0 °C; pH 7.07 ; Sp. Conductance 560 µS.

Pump\bailer depth: 31.0 feet.

Volume Purged: 18.0 gallons; Rate of Purge: 1.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Full-face respirator with organic vapor cartridges used.
Purge water is black for first five gallons.

Sampler: D. Stottlemyer
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 6- 17 -97

Well No: TD-5 Time Sample Taken: 10:00

Well Total Depth: 30.40 Casing Head Elevation: 589.49

Depth to Water: 22.88 Elevation of Water Level: 566.61

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 7.52) x 3 =

Purge Volume 3.84 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 16.8 °C; pH 6.71 ; Sp. Conductance 620 μS.

Intermed: Temperature 15.6 °C; pH 6.62 ; Sp. Conductance 680 μS.

Final: Temperature 16.0 °C; pH 8.30 ; Sp. Conductance 640 μS.

Pump\bailer depth: 29.0 feet.

Volume Purged: 4.0 gallons; Rate of Purge: 1.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Murky purge water at first. Had to wait for recharge to retrieve sample.

Sampler: D. Stottlemyer
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 6- 17 -97

Well No: WT-13A Time Sample Taken: 10:50

Well Total Depth: 35.06 Casing Head Elevation: 590.82

Depth to Water: 24.39 Elevation of Water Level: 566.43

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 10.67) x 3 =

Purge Volume 20.49 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 18.3 °C; pH 6.71 ; Sp. Conductance 420 µS.

Intermed: Temperature 16.2 °C; pH 6.63 ; Sp. Conductance 370 µS.

Final: Temperature 16.8 °C; pH 6.52 ; Sp. Conductance 440 µS.

Pump\bailer depth: 34.0 feet.

Volume Purged: 18.0 gallons; Rate of Purge: 2.0 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Purge water murky with very fine sand, cleaned up after ten gallons.

Sampler: D. Stottlemyer
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 6- 17 -97

Well No: WT-14A Time Sample Taken: 10:25

Well Total Depth: 35.43 Casing Head Elevation: 593.57

Depth to Water: 24.73 Elevation of Water Level: 568.84

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 10.7) x 3 =

Purge Volume 20.54 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 18.2 °C; pH 8.15 ; Sp. Conductance 3560 µS.

Intermed: Temperature 17.9 °C; pH 8.18 ; Sp. Conductance 3740 µS.

Final: Temperature 18.9 °C; pH 8.08 ; Sp. Conductance 3380 µS.

Pump\bailer depth: 28.0 feet.

Volume Purged: 8.0 gallons; Rate of Purge: 1.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Blockage at 28'. Had to wait for recharge to sample.

Sampler: D. Stottlemyer
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 6- 17 -97

Well No: WT-15A Time Sample Taken: 11:30

Well Total Depth: 24.87 Casing Head Elevation: 589.08

Depth to Water: 8.97 Elevation of Water Level: 580.11

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 15.9) x 3 =

Purge Volume 30.53 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 14.5 °C; pH 6.27 ; Sp. Conductance 310 µS.

Intermed: Temperature 14.3 °C; pH 6.14 ; Sp. Conductance 350 µS.

Final: Temperature 14.5 °C; pH 6.14 ; Sp. Conductance 270 µS.

Pump\bailer depth: 24.0 feet.

Volume Purged: 32.0 gallons; Rate of Purge: 2.0 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Purge water orange-rust color for first five gallons.
Solvent odor present. Water murky to fifteen gallons.

Sampler: D. Stottlemyer
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

3RD QUARTER 1997

DRAFT

MONSANTO CHEMICAL
1 MONSANTO ROAD
NITRO WV 25143

REIC JOB #: 0997-54678
CLIENT/SAMPLING SITE: MONSANTO CHEMICAL
PROJECT NO.: 97025.002
CUSTODY NO.'S: 1157 & 1156

Prepared By:
REI Consultants, Inc.
P O Box 286
Beaver WV 25813

Phone: 304-255-2500
800-999-0105
Fax: 304-255-2572

MONSANTO SAMPLE #: MW-1A
REIC SAMPLE #: 54678-1

DATE SAMPLED: 09-09-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	ND	mg/l	8240B	0.005	09-12-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	94
toluene-d8	102
4-bromofluorobenzene	98

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-1B
REIC SAMPLE #: 54678-2

DATE SAMPLED: 09-09-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	ND	mg/l	8240B	0.005	09-12-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	95
toluene-d8	102
4-bromofluorobenzene	97

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-5A
REIC SAMPLE #: 54678-3

DATE SAMPLED: 09-10-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	0.341	mg/l	8240B	0.005	09-15-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	93
toluene-d8	96
4-bromofluorobenzene	100

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-5B
REIC SAMPLE #: 54678-4

DATE SAMPLED: 09-10-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	3.10	mg/l	8240B	0.005	09-15-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	94
toluene-d8	100
4-bromofluorobenzene	103

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-20A
REIC SAMPLE #: 54678-5

DATE SAMPLED: 09-10-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	2.98	mg/l	8240B	0.005	09-15-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	94
toluene-d8	100
4-bromofluorobenzene	100

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-20B
REIC SAMPLE #: 54678-6

DATE SAMPLED: 09-10-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	0.755	mg/l	8240B	0.005	09-15-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	93
toluene-d8	95
4-bromofluorobenzene	100

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-22R
REIC SAMPLE #: 54678-7

DATE SAMPLED: 09-10-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.009	mg/l	8240B	0.005	09-15-97/TC
trichloroethene	0.007	mg/l	8240B	0.005	09-15-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	93
toluene-d8	105
4-bromofluorobenzene	97

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-23A
REIC SAMPLE #: 54678-8

DATE SAMPLED: 09-09-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	1.65	mg/l	8240B	0.005	09-15-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	98
toluene-d8	98
4-bromofluorobenzene	100

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-24A
REIC SAMPLE #: 54678-9

DATE SAMPLED: 09-10-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.987	mg/l	8240B	0.050	09-16-97/TC
trichloroethene	0.493	mg/l	8240B	0.050	09-16-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	90
toluene-d8	104
4-bromofluorobenzene	97

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-7 **DATE SAMPLED:** 09-10-97
REIC SAMPLE #: 54678-10 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	2.10	mg/l	8240B	0.500	09-12-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	95
toluene-d8	99
4-bromofluorobenzene	102

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-14
REIC SAMPLE #: 54678-11

DATE SAMPLED: 09-09-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	ND	mg/l	8240B	0.005	09-16-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	94
toluene-d8	100
4-bromofluorobenzene	101

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: WT-14A
REIC SAMPLE #: 54678-12

DATE SAMPLED: 09-09-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.268	mg/l	8240B	0.025	09-16-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	90
toluene-d8	91
4-bromofluorobenzene	100

SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	09-18-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	09-18-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	09-18-97/WP
2,4-dimethylphenol	0.097	mg/l	8270B	0.020	09-18-97/WP
2,4-dichlorophenol	0.032	mg/l	8270B	0.020	09-18-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	09-18-97/WP
2,4,6-trichlorophenol	0.108	mg/l	8270B	0.020	09-18-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	09-18-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	09-18-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	09-18-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	09-18-97/WP
o-cresol	ND	mg/l	8270B	0.020	09-18-97/WP
m,p-cresol	ND	mg/l	8270B	0.040	09-18-97/WP
2,4,5-trichlorophenol	ND	mg/l	8270B	0.020	09-18-97/WP

Surrogates	% Recovery
2-fluorophenol	52
phenol-d6	36
2,4,6-tribromophenol	103

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: WT-15A **DATE SAMPLED:** 09-09-97
REIC SAMPLE #: 54678-13 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.008	mg/l	8240B	0.005	09-16-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	80
toluene-d8	108
4-bromofluorobenzene	94

SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	09-18-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	09-18-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	09-18-97/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	09-18-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	09-18-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	09-18-97/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	09-18-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	09-18-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	09-18-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	09-18-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	09-18-97/WP
o-cresol	ND	mg/l	8270B	0.020	09-18-97/WP
m,p-cresol	ND	mg/l	8270B	0.040	09-18-97/WP
2,4,5-trichlorophenol	ND	mg/l	8270B	0.020	09-18-97/WP

Surrogates	% Recovery
2-fluorophenol	34
phenol-d6	26
2,4,6-tribromophenol	87

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: TD-5
REIC SAMPLE #: 54678-14

DATE SAMPLED: 09-09-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	ND	mg/l	8240B	0.005	09-16-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	92
toluene-d8	106
4-bromofluorobenzene	95

SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	09-18-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	09-18-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	09-18-97/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	09-18-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	09-18-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	09-18-97/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	09-18-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	09-18-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	09-18-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	09-18-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	09-18-97/WP
o-cresol	ND	mg/l	8270B	0.020	09-18-97/WP
m,p-cresol	ND	mg/l	8270B	0.040	09-18-97/WP
2,4,5-trichlorophenol	ND	mg/l	8270B	0.020	09-18-97/WP

Surrogates	% Recovery
2-fluorophenol	34
phenol-d6	26
2,4,6-tribromophenol	97

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: WT-13A
REIC SAMPLE #: 54678-15

DATE SAMPLED: 09-09-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	ND	mg/l	8240B	0.005	09-16-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	90
toluene-d8	100
4-bromofluorobenzene	98

SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	09-18-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	09-18-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	09-18-97/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	09-18-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	09-18-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	09-18-97/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	09-18-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	09-18-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	09-18-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	09-18-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	09-18-97/WP
o-cresol	ND	mg/l	8270B	0.020	09-18-97/WP
m,p-cresol	ND	mg/l	8270B	0.040	09-18-97/WP
2,4,5-trichlorophenol	0.175	mg/l	8270B	0.020	09-18-97/WP

Surrogates	% Recovery
2-fluorophenol	27
phenol-d8	22
2,4,6-tribromophenol	82

ND - None Detected at MQL
MQL - Minimum Quantifying Level

DATE 10-3-97

APPROVED Ivan W Leef
Ivan W. Leef

Janet M Satterfield
Janet M. Satterfield

Potesta & Associates, Inc.

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University of Charleston, Cox Hall
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CHAIN OF CUSTODY RECORD
№ 1157
PAGE 1 OF 2

CLIENT/SAMPLING SITE: Monsanto Chemical
CONTACT PERSON: D. Junker - Potesta + Assoc.
ADDRESS: 1 Monsanto Rd.
TELEPHONE/FAX: 357-4990 / 357-4988
CITY/STATE/ZIP: Nitro, WV 25143
SAMPLER: D. Junker
PROJECT NO.: 97025.002 DATE: 9-11-97
HOW SHIPPED: REIC Courier

SAMPLE LOG AND ANALYSIS REQUESTED

TURNAROUND TIME: X REGULAR ___ RUSH

PRESERVATIVES: 0 NO PRESERVATIVE, 1 HYDROCHLORIC ACID, 2 NITRIC ACID, 3 SULFURIC ACID, 4 SODIUM THIOSULFATE, 5 SODIUM HYDROXIDE, 6 ZINC ACETATE, 7 EDTA

ANALYSIS REQUESTED & METHOD / PRESERVATIVE CODES: TCE (1), Benzene (1), Phenols/Semi V (0)

SAMPLE ID	NO. & TYPE OF CONTAINERS	DATE/TIME	MATRIX	SAMPLE COMP/GRAB	TCE	Benzene	Phenols/Semi V									REMARKS
MW-1A	2-40ml	9-9-97 1215	Liq	Grab	X											Benzene MQL ~~0.002~~ 0.005
MW-1B	2-40ml.	9-9-97 1720	"	"	X											TCE MQL 0.005
MW-5A	2-40ml	9-10-97 1430	"	"	X											
MW-5B	2-40ml	9-10-97 1530	"	"	X											
MW-20A	2-40ml	9-10-97 1130	"	"	X											
MW-20B	2-4ml	9-10-97 1230	"	"	X											
MW-22R	2-40ml.	9/10/97 1030	"	"	X	X										
MW-23A	2-40ml	9/9/97 1830	"	"	X											
MW-2~~3~~A	2-40ml	9-10-97 1530	"	"	X	X										
MW-7	~~9-10-97~~ 2-40ml	9-10-97 1630	"	"		X										
MW-14	9-9-97 1800		"	"		X										

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
David M. Junker	9/11/97	David Kelley	David Kelley	9/11/97	

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	CONDITION ON ARRIVAL:
		Juanita Ritter	9/11/97 @ 4:45	OK. 4.3°C

COMMENTS: Analysis by REIC Lab. - Bill to Tony Tuk at Monsanto
[illegible] Fax 357-498[illegible]

Potesta & Associates, Inc.
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University of Charleston, Cox Hall
2300 MacCorkle Ave. SE, Charleston, WV 25304
Tel: (304) 357-4990 FAX: (304) 357-4988

CHAIN OF CUSTODY RECORD
№ 1156
PAGE 2 OF 2

OCT 03 '97 04:27PM REIC LABS

CLIENT/SAMPLING SITE: Monsanto Chemical
ADDRESS: 1 Monsanto Rd.
CITY/STATE/ZIP: Nitro, WV 25143
PROJECT NO.: 97025.002 DATE: 9-11-97

CONTACT PERSON: D. Junker - Potesta + Associates
TELEPHONE/FAX: 357-4990 / 357-4988
SAMPLER: D. Junker
HOW SHIPPED: REIC Courier

SAMPLE LOG AND ANALYSIS REQUESTED

TURNAROUND TIME: X REGULAR ___ RUSH

PRESERVATIVES
0 NO PRESERVATIVE
1 HYDROCHLORIC ACID
2 NITRIC ACID
3 SULFURIC ACID
4 SODIUM THIOSULFATE
5 SODIUM HYDROXIDE
6 ZINC ACETATE
7 EDTA

PRESERVATIVE CODES: 1, 1

ANALYSIS REQUESTED & METHOD: TCE; Benzene; Phenols/Semi-Vols; Nutrient + Anal.

SAMPLE ID	NO. & TYPE OF CONTAINERS	DATE/TIME	MATRIX	SAMPLE COMP/GRAB	TCE	Benzene	Phenols/Semi-Vols	Nutrient + Anal.	REMARKS
WT-14A	1-L, 2 Plastic, 2-40 ml	9/9/97 1520	Liq	Grab	X	X	X		MQL-0.020 Include o-cresol and m,p-cresol
WT-15A	1-G. Liter, 2-40 ml	9-9-97 1240	" "	"	X	X			
TD-5	1-G Liter, 2-40 ml	9-9-97 1430	"	"	X	X			
WT-13A	1-G. Liter, 2-40 ml	9-9-97 1140	"	"	X	X			

Nutrient Analysis: Ammonia, Ortho phosphate, TKN, pH, Nitrates and nitrites, Total phosphates

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
David N Junker	9/11/97	Darrell Kelly	Darrell Kelly	9/11/97	

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	CONDITION ON ARRIVAL
		Juanita Rettler	9/11/97 @ 4:45	Ok 4.3°C

COMMENTS Analysis by REIC Lab. - Billing to Tony Tuk of Monsanto ... Fax 357-4988

P.21/21

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-10-97

Well No: MW-7 Time Sample Taken: 16:30

Well Total Depth: 30.00 Casing Head Elevation: 594.03

Depth to Water: 27.92 Elevation of Water Level: 566.11

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 2.1) x 3 =

Purge Volume 1.1 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer X or Pump ____

Initial: Temperature 15.8 °C; pH 7.3 ; Sp. Conductance 400 µS.

Intermed: Temperature ____ °C; pH ____ ; Sp. Conductance ____ µS.

Final: Temperature 16.0 °C; pH 7.2 ; Sp. Conductance 460 µS.

Pump\bailer depth: 29.0 feet.

Volume Purged: 1.0 gallons; Rate of Purge: 0.3 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Petroleum product (18") was bailed off top of water column. Hung bailer in well to get clean sample.

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: **Monsanto Performance Monitoring** Date: 9-9-97

Well No: MW-1B Time Sample Taken: 17:20

Well Total Depth: 55.0 Casing Head Elevation: 594.38

Depth to Water: 18.74 Elevation of Water Level: 575.64

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 36.3) x 3 =

Purge Volume 18.5 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 15.3 °C; pH 5.6 ; Sp. Conductance 400 µS.

Intermed: Temperature 15.2 °C; pH 5.5 ; Sp. Conductance 410 µS.

Final: Temperature 15.0 °C; pH 5.5 ; Sp. Conductance 400 µS.

Pump\bailer depth: 35.0 feet.

Volume Purged: 22.0 gallons; Rate of Purge: 1.0 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ______

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-9-97

Well No: MW-14 Time Sample Taken: 18:00

Well Total Depth: 30.43 Casing Head Elevation: 593.57

Depth to Water: 15.69 Elevation of Water Level: 577.88

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 19.74) x 3 =

Purge Volume 10.0 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 15.7 °C; pH 5.5 ; Sp. Conductance 250 µS.

Intermed: Temperature 15.5 °C; pH 5.3 ; Sp. Conductance 290 µS.

Final: Temperature 15.4 °C; pH 5.3 ; Sp. Conductance 270 µS.

Pump\bailer depth: 29.0 feet.

Volume Purged: 10.0 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ______

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-10-97

Well No: MW-24A Time Sample Taken: 15:30

Well Total Depth: 35.0 Casing Head Elevation: 594.58

Depth to Water: 26.21 Elevation of Water Level: 568.37

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 8.8) x 3 =

Purge Volume 16.88 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 15.5 °C; pH 6.3 ; Sp. Conductance 790 µS.

Intermed: Temperature 15.4 °C; pH 6.4 ; Sp. Conductance 910 µS.

Final: Temperature 15.3 °C; pH 6.1 ; Sp. Conductance 940 µS.

Pump\bailer depth: 33.0 feet.

Volume Purged: 18.0 gallons; Rate of Purge: 0.4 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Water black and smelly-cleared somewhat by end of purge.

Used full face respirator with organic vapor filters.

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-9-97

Well No: MW-1A Time Sample Taken: 16:30

Well Total Depth: 32.0 Casing Head Elevation: 594.37

Depth to Water: 18.62 Elevation of Water Level: 575.75

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 13.4) x 3 =

Purge Volume 6.8 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 15.3 °C; pH 5.8 ; Sp. Conductance 360 µS.

Intermed: Temperature 15.4 °C; pH 5.9 ; Sp. Conductance 430 µS.

Final: Temperature 15.2 °C; pH 5.9 ; Sp. Conductance 350 µS.

Pump\bailer depth: ________ feet.

Volume Purged: 10.0 gallons; Rate of Purge: 0.3 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ______

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-9-97

Well No: WT-13A Time Sample Taken: 11:40

Well Total Depth: 35.06 Casing Head Elevation: 590.82

Depth to Water: 24.41 Elevation of Water Level: 566.41

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 10.65) x 3 =

Purge Volume 20.4 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 15.3 °C; pH 6.3 ; Sp. Conductance 450 µS.

Intermed: Temperature 15.1 °C; pH 6.2 ; Sp. Conductance 430 µS.

Final: Temperature 14.8 °C; pH 6.1 ; Sp. Conductance 435 µS.

Pump\bailer depth: 34.0 feet.

Volume Purged: 22.0 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ______

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-9-97

Well No: WT-15A Time Sample Taken: 12:40

Well Total Depth: 24.87 Casing Head Elevation: 589.08

Depth to Water: 9.07 Elevation of Water Level: 580.01

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 15.8) x 3 =

Purge Volume 30.3 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 15.3 °C; pH 5.8 ; Sp. Conductance 320 µS.

Intermed: Temperature 15.0 °C; pH 5.9 ; Sp. Conductance 310 µS.

Final: Temperature 15.0 °C; pH 5.8 ; Sp. Conductance 310 µS.

Pump\bailer depth: 23.0 feet.

Volume Purged: 25.0 gallons; Rate of Purge: 1.0 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ____

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-9-97

Well No: TD-5 Time Sample Taken: 14:30

Well Total Depth: 30.40 Casing Head Elevation: 589.49

Depth to Water: 22.90 Elevation of Water Level: 566.59

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 7.5) x 3 =

Purge Volume 3.8 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer _____ or Pump X

Initial: Temperature 15.5 °C; pH 6.5 ; Sp. Conductance 630 μS.

Intermed: Temperature 15.5 °C; pH 6.4 ; Sp. Conductance 640 μS.

Final: Temperature 15.4 °C; pH 6.4 ; Sp. Conductance 620 μS.

Pump\bailer depth: 29.0 feet.

Volume Purged: 9.5 gallons; Rate of Purge: 0.25 gal/min.

Sample Protocol: See Chain-of-Custody

Comments:

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-9-97

Well No: WT-14A Time Sample Taken: 15:20

Well Total Depth: 35.43 Casing Head Elevation: 593.57

Depth to Water: 25.79 Elevation of Water Level: 567.78

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 9.5) x 3 =

Purge Volume 4.9 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 15.1 °C; pH 8.2 ; Sp. Conductance 3490 μS.

Intermed: Temperature 14.9 °C; pH 8.0 ; Sp. Conductance 3310 μS.

Final: Temperature 15.0 °C; pH 8.0 ; Sp. Conductance 3400 μS.

Pump\bailer depth: 34.0 feet.

Volume Purged: 10.0 gallons; Rate of Purge: 0.75 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ______

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-9-97

Well No: MW-23A Time Sample Taken: 18:30

Well Total Depth: 35.0 Casing Head Elevation: 598.82

Depth to Water: 28.09 Elevation of Water Level: 570.73

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 6.91) x 3 =

Purge Volume 13.30 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 15.4 °C; pH 6.9 ; Sp. Conductance 870 µS.

Intermed: Temperature 15.3 °C; pH 6.9 ; Sp. Conductance 890 µS.

Final: Temperature 15.0 °C; pH 6.7 ; Sp. Conductance 910 µS.

Pump\bailer depth: 33.0 feet.

Volume Purged: 11.0 gallons; Rate of Purge: 0.3 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Well purged dry-sampled first recovery.

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-10-97

Well No: MW-22R Time Sample Taken: 10:30

Well Total Depth: 40.0 Casing Head Elevation: 596.76

Depth to Water: 29.03 Elevation of Water Level: 567.73

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 10.97) x 3 =

Purge Volume 21.39 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 15.1 °C; pH 6.5 ; Sp. Conductance 740 µS.

Intermed: Temperature 15.2 °C; pH 6.5 ; Sp. Conductance 750 µS.

Final: Temperature 15.0 °C; pH 6.4 ; Sp. Conductance 760 µS.

Pump\bailer depth: 35.0 feet.

Volume Purged: 15.0 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Well pumped dry twice-sampled second recovery.

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-10-97

Well No: MW-5A Time Sample Taken: 14:30

Well Total Depth: 33.0 Casing Head Elevation: 594.65

Depth to Water: 26.24 Elevation of Water Level: 568.36

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 6.7) x 3 =

Purge Volume 3.4 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 15.5 °C; pH 6.1 ; Sp. Conductance 790 µS.

Intermed: Temperature 15.2 °C; pH 5.4 ; Sp. Conductance 610 µS.

Final: Temperature 15.0 °C; pH 5.5 ; Sp. Conductance 650 µS.

Pump\bailer depth: 31.0 feet.

Volume Purged: 5.0 gallons; Rate of Purge: 0.3 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Well water clear throughout purge.

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-10-97

Well No: MW-5B Time Sample Taken: 15:20

Well Total Depth: 56.0 Casing Head Elevation: 594.91

Depth to Water: 25.46 Elevation of Water Level: 568.45

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 29.5) x 3 =

Purge Volume 15.0 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 15.2 °C; pH 5.8 ; Sp. Conductance 1610 μS.

Intermed: Temperature 15.0 °C; pH 5.9 ; Sp. Conductance 1530 μS.

Final: Temperature 15.0 °C; pH 5.8 ; Sp. Conductance 1510 μS.

Pump\bailer depth: 40.0 feet.

Volume Purged: 18.0 gallons; Rate of Purge: 1.0 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Well clear with some sand throughout purge.

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-10-97

Well No: MW-20A Time Sample Taken: 11:30

Well Total Depth: 40.00 Casing Head Elevation: 596.71

Depth to Water: 28.62 Elevation of Water Level: 568.09

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 11.38) x 3 =

Purge Volume 5.8 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 15.5 °C; pH 6.7 ; Sp. Conductance 970 µS.

Intermed: Temperature 15.2 °C; pH 6.8 ; Sp. Conductance 960 µS.

Final: Temperature 15.1 °C; pH 6.7 ; Sp. Conductance 990 µS.

Pump\bailer depth: 38.0 feet.

Volume Purged: 4.0 gallons; Rate of Purge: 1.0 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Well purged dry twice-sampled second recovery.

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 9-10-97

Well No: MW-20B Time Sample Taken: 12:30

Well Total Depth: 57.0 Casing Head Elevation: 596.76

Depth to Water: 29.15 Elevation of Water Level: 567.61

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 27.8) x 3 =

Purge Volume 14.2 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 15.1 °C; pH 6.5 ; Sp. Conductance 940 µS.

Intermed: Temperature 15.0 °C; pH 6.4 ; Sp. Conductance 2160 µS.

Final: Temperature 15.1 °C; pH 6.5 ; Sp. Conductance 2070 µS.

Pump\bailer depth: 40.0 feet.

Volume Purged: 25.0 gallons; Rate of Purge: 1.0 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Water started clear for 3 gallons, then turned dark brown transparent to finish purge.

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

4TH QUARTER 1997

DRAFT

MONSANTO CHEMICAL
1 MONSANTO ROAD
NITRO WV 25143

REIC JOB #: 1197-56615
CLIENT/SAMPLING SITE: MONSANTO CHEMICAL
PROJECT NO.: 97006-004
CUSTODY NO.'S: 1317 & 1319

Prepared By:
REI Consultants, Inc.
P O Box 286
Beaver WV 25813

Phone: 304-255-2500
800-999-0105
Fax: 304-255-2572

MONSANTO SAMPLE #: MW-1A
REIC SAMPLE #: 56615-1

DATE SAMPLED: 11-20-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	0.006	mg/l	8240B	0.005	11-26-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	93
toluene-d8	102
4-bromofluorobenzene	108

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-1B **DATE SAMPLED:** 11-20-97
REIC SAMPLE #: 56615-2 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	ND	mg/l	8240B	0.005	11-26-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	94
toluene-d8	103
4-bromofluorobenzene	109

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-5A
REIC SAMPLE #: 56615-3

DATE SAMPLED: 11-21-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	0.797	mg/l	8240B	0.005	11-27-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	92
toluene-d8	103
4-bromofluorobenzene	111

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-5B **DATE SAMPLED:** 11-21-97
REIC SAMPLE #: 56615-4 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	3.44	mg/l	8240B	0.005	11-27-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	91
toluene-d8	104
4-bromofluorobenzene	114

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-20A
REIC SAMPLE #: 56615-5

DATE SAMPLED: 11-21-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	9.18	mg/l	8240B	0.005	11-27-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	92
toluene-d8	103
4-bromofluorobenzene	112

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-20B **DATE SAMPLED:** 11-21-97
REIC SAMPLE #: 56615-6 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	1.74	mg/l	8240B	0.005	11-27-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	90
toluene-d8	103
4-bromofluorobenzene	113

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-22R **DATE SAMPLED:** 11-21-97
REIC SAMPLE #: 56615-7 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.012	mg/l	8240B	0.005	11-26-97/TC
trichloroethene	0.077	mg/l	8240B	0.005	11-26-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	93
toluene-d8	103
4-bromofluorobenzene	109

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-23A
REIC SAMPLE #: 56615-8
DATE SAMPLED: 11-21-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	2.09	mg/l	8240B	0.005	12-01-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	91
toluene-d8	102
4-bromofluorobenzene	112

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-24A
REIC SAMPLE #: 56615-9

DATE SAMPLED: 11-21-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.909	mg/l	8240B	0.250	11-26-97/TC
trichloroethene	1.29	mg/l	8240B	0.250	11-26-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	94
toluene-d8	105
4-bromofluorobenzene	112

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-7 **DATE SAMPLED:** 11-20-97
REIC SAMPLE #: 56615-10 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	5.34	mg/l	8240B	0.250	12-01-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	92
toluene-d8	103
4-bromofluorobenzene	111

MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: MW-14
REIC SAMPLE #: 56615-11

DATE SAMPLED: 11-20-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	ND	mg/l	8240B	0.005	11-26-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	92
toluene-d8	102
4-bromofluorobenzene	112

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: WT-14A **DATE SAMPLED:** 11-20-97
REIC SAMPLE #: 56615-12 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.034	mg/l	8240B	0.005	11-26-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	93
toluene-d8	104
4-bromofluorobenzene	109

SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	12-04-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	12-04-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	12-04-97/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	12-04-97/WP
2,4-dichlorophenol	0.024	mg/l	8270B	0.020	12-04-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	12-04-97/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	12-04-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	12-04-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	12-04-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	12-04-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	12-04-97/WP
o-cresol	ND	mg/l	8270B	0.020	12-04-97/WP
m,p-cresol	ND	mg/l	8270B	0.040	12-04-97/WP
2,4,5-trichlorophenol	0.074	mg/l	8270B	0.020	12-04-97/WP

Surrogates	% Recovery
2-fluorophenol	30
phenol-d6	17
2,4,6-tribromophenol	50

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: WT-14A
REIC SAMPLE #: 56615-12

DATE SAMPLED: 11-20-97
MATRIX: LIQUID

GENERAL CHEMISTRY

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
Ammonia (as N)	81.1	mg/l	4500-NH_3 B&E	0.10	11-25-97/KM
Nitrate (as N)	23.5	mg/l	300	0.10	11-26-97/DM
Nitrite (as N)	ND	mg/l	300	0.50	11-26-97/DM
Orthophosphate	0.55	mg/l	4500-P&E	0.05	11-25-97/DM
pH	6.70	SU	4500-H^+ B	NA	11-25-97/KM
Phosphorus	0.70	mg/l	4500-P B_5&E	0.05	12-03-97/DM
TKN (as N)	105	mg/l	351.3	0.10	11-25-97/KM

NA - Not Applicable
ND - None Detected at MQL
MQL - Minimum Quantifying Level
SU - Standard Units
TKN - Total Kjeldahl Nitrogen

MONSANTO SAMPLE #: WT-15A | **DATE SAMPLED:** 11-20-97
REIC SAMPLE #: 56615-13 | **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.008	mg/l	8240B	0.005	11-26-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	91
toluene-d8	103
4-bromofluorobenzene	111

SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	12-04-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	12-04-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	12-04-97/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	12-04-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	12-04-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	12-04-97/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	12-04-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	12-04-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	12-04-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	12-04-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	12-04-97/WP
o-cresol	ND	mg/l	8270B	0.020	12-04-97/WP
m,p-cresol	ND	mg/l	8270B	0.040	12-04-97/WP
2,4,5-trichlorophenol	ND	mg/l	8270B	0.020	12-04-97/WP

Surrogates	% Recovery
2-fluorophenol	51
phenol-d6	37
2,4,6-tribromophenol	94

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: TD-5 **DATE SAMPLED: 11-20-97**
REIC SAMPLE #: 56615-14 **MATRIX: LIQUID**

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	ND	mg/l	8240B	0.005	11-26-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	91
toluene-d8	104
4-bromofluorobenzene	108

SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	12-04-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	12-04-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	12-04-97/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	12-04-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	12-04-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	12-04-97/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	12-04-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	12-04-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	12-04-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	12-04-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	12-04-97/WP
o-cresol	ND	mg/l	8270B	0.020	12-04-97/WP
m,p-cresol	ND	mg/l	8270B	0.040	12-04-97/WP
2,4,5-trichlorophenol	ND	mg/l	8270B	0.020	12-04-97/WP

Surrogates	% Recovery
2-fluorophenol	58
phenol-d6	41
2,4,6-tribromophenol	97

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: WT-13A **DATE SAMPLED:** 11-20-97
REIC SAMPLE #: 56615-15 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	ND	mg/l	8240B	0.005	11-26-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	95
toluene-d8	105
4-bromofluorobenzene	112

SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	12-04-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	12-04-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	12-04-97/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	12-04-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	12-04-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	12-04-97/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	12-04-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	12-04-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	12-04-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	12-04-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	12-04-97/WP
o-cresol	ND	mg/l	8270B	0.020	12-04-97/WP
m,p-cresol	ND	mg/l	8270B	0.040	12-04-97/WP
2,4,5-trichlorophenol	0.157	mg/l	8270B	0.020	12-04-97/WP

Surrogates	% Recovery
2-fluorophenol	54
phenol-d6	37
2,4,6-tribromophenol	87

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: TRIP BLANK **MATRIX:** LIQUID
REIC SAMPLE #: 56615-16

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	ND	mg/l	8240B	0.005	11-26-97/TC
trichloroethene	ND	mg/l	8240B	0.005	11-26-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	92
toluene-d8	105
4-bromofluorobenzene	108

ND - None Detected at MQL
MQL - Minimum Quantifying Level

DATE 12-5-97

APPROVED Ivan W Leef
Ivan W. Leef

Janet M Satterfield
Janet M. Satterfield

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CHAIN OF CUSTODY RECORD

№ 1317

PAGE 1 OF 2

CLIENT/SAMPLING SITE: MONSANTO CHEMICAL
ADDRESS: 1 MONSANTO ROAD
CITY/STATE/ZIP: NITRO WV 25143
PROJECT NO.: 97006 - 004 DATE: 11-21-97

CONTACT PERSON: DAVE JUNKER - POTESTA
TELEPHONE/FAX: SEE ABOVE
SAMPLER: T. SEDOSKY
HOW SHIPPED:

SAMPLE LOG AND ANALYSIS REQUESTED

TURNAROUND TIME: X REGULAR ___ RUSH

PRESERVATIVES
0 NO PRESERVATIVE
1 HYDROCHLORIC ACID
2 NITRIC ACID
3 SULFURIC ACID
4 SODIUM THIOSULFATE
5 SODIUM HYDROXIDE
6 ZINC ACETATE
7 EDTA

ANALYSIS REQUESTED & METHOD / PRESERVATIVE CODES

SAMPLE ID	NO. & TYPE OF CONTAINERS	DATE/TIME	MATRIX	SAMPLE COMP/GRAB	TCE	BENZENE	PHENOLS/SEMI VOLS									REMARKS
MW-1A	2-40mL	11-20-97 1740	LIQ	GRAB	X											BENZENE MQL
MW-1B	↓	11-20-97 1745	↓	↓	X											=0.005
MW-5A		11-21-97 1515			X											TCE MQL 0.005
MW-5B		11-21-97 1455			X											
MW-20A		11-21-97 1215			X											
MW-20B		11-21-97 1205			X											
MW-22R		11-21-97 1620			X	X										
MW-23A		11-21-97 1100			X											
MW-24A		11-21-97 0930			X	X										
MW-7		11-20-97 1610				X										
MW-14	↓	11-20-97 1700	↓	↓		X										

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
[signature]	11/24 4:10pm	[signature]	[signature]	11-24-97 6:10pm	

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	CONDITION ON ARRIVAL:
		[signature]	11/24/97 @ 6:10	OK 4.0°C

COMMENTS: LAB: REIC - BILLING TO TONY TUK @ MONSANTO
COPY OF RESULTS TO DAVE JUNKER @ POTESTA

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CHAIN OF CUSTODY RECORD
No 1319
PAGE 2 OF 2

CLIENT/SAMPLING SITE: MONSANTO CHEMICAL
ADDRESS: 1 MONSANTO ROAD
CITY/STATE/ZIP: NITRO WV 25143
PROJECT NO.: 97006-004 DATE: 11-21-97
CONTACT PERSON: DAVE JUNKER - POTESTA
TELEPHONE/FAX: SEE ABOVE
SAMPLER: T. SEDOSKY
HOW SHIPPED:

SAMPLE LOG AND ANALYSIS REQUESTED

TURNAROUND TIME: X REGULAR ___ RUSH

PRESERVATIVES
0 NO PRESERVATIVE
1 HYDROCHLORIC ACID
2 NITRIC ACID
3 SULFURIC ACID
4 SODIUM THIOSULFATE
5 SODIUM HYDROXIDE
6 ZINC ACETATE
7 EDTA

PRESERVATIVE CODES / ANALYSIS REQUESTED & METHOD

SAMPLE ID	NO. & TYPE OF CONTAINERS	DATE/TIME	MATRIX	SAMPLE COMP/GRAB	TCE	BENZENE	PHENOLS/SEMI-VOLS	NUTRIENT ANAL.	REMARKS
WT-14A	2-1L(P) 1-500 (P) 1-1L(G) 2-40mL	11-20-97 1100	LIQUID	GRAB	X	X	X		MQL-0.020 INCLUDE o-CRESOL
WT-15A	1-1L(G) 2-40mL	11-20-97 1440	↓	↓	X	X			m,p-CRESOL
TD-5	1-1 LITER(G) 2-40mL	11-20-97 1200			X	X			
WT-13A	1-1 LITER(G) 2-40mL	11-20-97 1530			X	X			
TRIP BLANK	2-40mL								

NUTRIENT ANALYSES: AMMONIA, ORTHO PHOSPH TKN, pH, NITRATES & NITRITES, TOTAL PHOSPHATES.

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
[signature]	11/24 4:00	[signature]	[signature]	11-24-97 6:10 pm	

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	CONDITION ON ARRIVAL:
		Juanita Ritter	11/24/97 @ 6:10	OK 4° ref

COMMENTS: LAB: REIC - BILLING TO TONY TUK @ MONSANTO
COPY OF RESULTS TO DAVE JUNKER @ POTESTA

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 11-20-97

Well No: MW-1A Time Sample Taken: 17:40

Well Total Depth: 32.0 Casing Head Elevation: 594.37

Depth to Water: 19.37 Elevation of Water Level: 575.00

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 12.63) x 3 =

Purge Volume 6.44 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 17.5 °C; pH 6.6 ; Sp. Conductance 580 µS.

Intermed: Temperature 17.6 °C; pH 6.3 ; Sp. Conductance 550 µS.

Final: Temperature 17.6 °C; pH 6.2 ; Sp. Conductance 560 µS.

Pump\bailer depth: 30.0 feet.

Volume Purged: 8.0 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ______

Sampler: Tim Sedosky
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 11-20-97

Well No: MW-1B Time Sample Taken: 17:45

Well Total Depth: 55.0 Casing Head Elevation: 594.38

Depth to Water: 19.44 Elevation of Water Level: 574.94

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 35.56) x 3 =

Purge Volume 18.14 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 16.8 °C; pH 6.5 ; Sp. Conductance 650 µS.

Intermed: Temperature 17.0 °C; pH 5.9 ; Sp. Conductance 630 µS.

Final: Temperature 17.0 °C; pH 6.0 ; Sp. Conductance 650 µS.

Pump\bailer depth: 53.0 feet.

Volume Purged: 20.0 gallons; Rate of Purge: 0.50 gal/min.

Sample Protocol: See Chain-of-Custody

Comments:

Sampler: Tim Sedosky
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 11-21-97

Well No: MW-5A Time Sample Taken: 15:15

Well Total Depth: 33.0 Casing Head Elevation: 594.65

Depth to Water: 25.90 Elevation of Water Level: 568.75

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 7.1) x 3 =

Purge Volume 3.6 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer X or Pump ____

Initial: Temperature ____ °C; pH ____; Sp. Conductance ____ µS.

Intermed: Temperature ____ °C; pH ____; Sp. Conductance ____ µS.

Final: Temperature ____ °C; pH ____; Sp. Conductance ____ µS.

Pump\bailer depth: 32.0 feet.

Volume Purged: 5.0 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Bailed 5 gallons- let recharge- sampled. Semi-cloudy brown purge water. Water quality meter damaged- no info recorded.

Sampler: Tim Sedosky
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 11-21-97

Well No: MW-5B Time Sample Taken: 14:55

Well Total Depth: 56.0 Casing Head Elevation: 594.91

Depth to Water: 26.54 Elevation of Water Level: 568.37

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 29.46) x 3 =

Purge Volume 15.07 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 20.0 °C; pH ______; Sp. Conductance 1700 µS.

Intermed: Temperature ______ °C; pH ______; Sp. Conductance ______ µS.

Final: Temperature ______ °C; pH ______; Sp. Conductance ______ µS.

Pump\bailer depth: 45.0 feet.

Volume Purged: 17.0 gallons; Rate of Purge: 0.75 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Mostly clear purge. Water quality meter got a bit damp.
No info gathered.

Sampler: Tim Sedosky
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 11-20-97

Well No: MW-7 Time Sample Taken: 16:10

Well Total Depth: 31.66 Casing Head Elevation: 594.03

Depth to Water: 30.20 Elevation of Water Level: 563.83

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 1.5) x 3 =

Purge Volume 0.8 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer X or Pump ______

Initial: Temperature ______ °C; pH ______; Sp. Conductance ______ µS.

Intermed: Temperature ______ °C; pH ______; Sp. Conductance ______ µS.

Final: Temperature 15.0 °C; pH 7.8 ; Sp. Conductance 1000 µS.

Pump\bailer depth: TD - 31.66 feet.

Volume Purged: 1.0 gallons; Rate of Purge: N/A gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Bailed 1.0 gallon of product.

Sampler: Tim Sedosky
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 11-20-97

Well No: MW-14 Time Sample Taken: 17:00

Well Total Depth: 30.43 Casing Head Elevation: 593.57

Depth to Water: 16.34 Elevation of Water Level: 577.23

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 14.09) x 3 =

Purge Volume 7.19 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 15.8 °C; pH 7.0 ; Sp. Conductance 310 µS.

Intermed: Temperature 15.7 °C; pH 6.8 ; Sp. Conductance 280 µS.

Final: Temperature 15.7 °C; pH 6.6 ; Sp. Conductance 270 µS.

Pump\bailer depth: 28.5 feet.

Volume Purged: 10.0 gallons; Rate of Purge: 0.50 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: 0-5 gallons- slightly tinted brown. 5-10 gallons- Clear. Clear sample.

Sampler: Tim Sedosky
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 11-21-97

Well No: MW-20A Time Sample Taken: 12:15

Well Total Depth: 40.00 Casing Head Elevation: 596.09

Depth to Water: 27.62 Elevation of Water Level: 568.47

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 12.38) x 3 =

Purge Volume 6.31 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer X or Pump ______

Initial: Temperature 17.4 °C; pH 7.50 ; Sp. Conductance 1260 µS.

Intermed: Temperature 19.0 °C; pH 7.56 ; Sp. Conductance 1420 µS.

Final: Temperature 18.2 °C; pH 7.79 ; Sp. Conductance 1480 µS.

Pump\bailer depth: 40.0 feet.

Volume Purged: 3.0 gallons; Rate of Purge: 0.1 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Purged dry twice. Sampled second recovery.

Sampler: Tim Sedosky
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 11-21-97

Well No: MW-20B Time Sample Taken: 12:05

Well Total Depth: 57.0 Casing Head Elevation: 596.76

Depth to Water: 27.56 Elevation of Water Level: 569.20

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 29.44) x 3 =

Purge Volume 15.01 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 18.4 °C; pH 7.15 ; Sp. Conductance 1700 µS.

Intermed: Temperature 19.4 °C; pH 7.53 ; Sp. Conductance 2760 µS.

Final: Temperature 22.1 °C; pH 7.60 ; Sp. Conductance 3200 µS.

Pump\bailer depth: 45.0 feet.

Volume Purged: 15.0 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Water started clear for 3 gallons, then turned coffee colored with urea odor. Water turned lighter prior to sampling.

Sampler: Tim Sedosky
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 11-21-97

Well No: MW-22R Time Sample Taken: 16:20

Well Total Depth: 40.0 Casing Head Elevation: 596.76

Depth to Water: 28.88 Elevation of Water Level: 567.88

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 11.12) x 3 =

Purge Volume 21.35 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature ______°C; pH ______; Sp. Conductance ______µS.

Intermed: Temperature ______°C; pH ______; Sp. Conductance ______µS.

Final: Temperature ______°C; pH ______; Sp. Conductance ______µS.

Pump\bailer depth: 35.0 feet.

Volume Purged: ______ gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Water quality meter damaged-no info gathered.

Sampler: Tim Sedosky
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: **Monsanto Performance Monitoring** Date: 11-21-97

Well No: MW-23A Time Sample Taken: 11:00

Well Total Depth: 35.0 Casing Head Elevation: 598.82

Depth to Water: 28.34 Elevation of Water Level: ~~592.16~~ 570.48

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 6.66) x 3 =

Purge Volume 12.78 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 16.6 °C; pH 6.05 ; Sp. Conductance 1700 µS.

Intermed: Temperature 17.3 °C; pH 6.12 ; Sp. Conductance 1630 µS.

Final: Temperature 16.5 °C; pH 6.50 ; Sp. Conductance 1460 µS.

Pump\bailer depth: 33.0 feet.

Volume Purged: 6.0 gallons; Rate of Purge: 0.3 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Pumped dry-sampled first recovery.

Sampler: Tim Sedosky
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 11-21-97

Well No: MW-24A Time Sample Taken: 09:30

Well Total Depth: 35.0 Casing Head Elevation: 594.58

Depth to Water: 26.20 Elevation of Water Level: 568.38

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 8.8) x 3 =

Purge Volume 16.90 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 14.6 °C; pH 7.3 ; Sp. Conductance 3800 µS.

Intermed: Temperature 16.2 °C; pH 7.2 ; Sp. Conductance 3600 µS.

Final: Temperature 16.2 °C; pH 6.29 ; Sp. Conductance 3920 µS.

Pump\bailer depth: 32.0 feet.

Volume Purged: 25.0 gallons; Rate of Purge: 0.75 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Black with nasty odor. In full face respirator with organic vapor cartridges. Clearing up after 8 gallons.

Sampler: Dennis Stottlemyer
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 11-20-97

Well No: TD-5 Time Sample Taken: 12:00

Well Total Depth: 30.40 Casing Head Elevation: 589.49

Depth to Water: 23.00 Elevation of Water Level: 566.49

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 7.4) x 3 =

Purge Volume 3.77 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 15.7 °C; pH 6.9 ; Sp. Conductance 1360 µS.

Intermed: Temperature 15.8 °C; pH 6.50 ; Sp. Conductance 1740 µS.

Final: Temperature 16.0 °C; pH 6.45 ; Sp. Conductance 1760 µS.

Pump\bailer depth: 28.0 feet.

Volume Purged: 8.0 gallons; Rate of Purge: 0.50 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Initial purge light tint. Very clear sample.

Sampler: Tim Sedosky
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: **Monsanto Performance Monitoring** Date: 11-20-97

Well No: WT-13A Time Sample Taken: 15:30

Well Total Depth: 35.06 Casing Head Elevation: 590.82

Depth to Water: 24.45 Elevation of Water Level: 566.37

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 10.61) x 3 =

Purge Volume 20.37 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer_______ or Pump X

Initial: Temperature 16.5 °C; pH 7.18 ; Sp. Conductance 750 μS.

Intermed: Temperature 16.4 °C; pH 6.95 ; Sp. Conductance 1180 μS.

Final: Temperature 17.4 °C; pH 6.64 ; Sp. Conductance 1150 μS.
17.2 6.40 1140

Pump\bailer depth: 34.0 feet.

Volume Purged: 20.0 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Initial purge 0-2 gal.-light brown, high load of fine sand. Clear sample, very slight tint.

Sampler: Tim Sedosky
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 11-20-97

Well No: WT-14A Time Sample Taken: 11:00

Well Total Depth: 35.43 Casing Head Elevation: 593.57

Depth to Water: 26.59 Elevation of Water Level: 566.98

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 8.84) x 3 =

Purge Volume 16.97 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 17.6 °C; pH 8.55 ; Sp. Conductance 1142 µS.

Intermed: Temperature 16.8 °C; pH 8.34 ; Sp. Conductance 1160 µS.

Final: Temperature 17.1 °C; pH 8.56 ; Sp. Conductance 1162 µS.

Pump\bailer depth: ~30.0 feet.

Volume Purged: 10.0 gallons; Rate of Purge: 0.75 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Purged 3 gallons and well is dry (but 5' bailer is hung up in bottom of well). Light brown in color. Let recharge 5 min. Adjust rate of purge to <0.506pm. Purge 3 more gal. and dry again.

Sampler: Tim Sedosky
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 11-20-97

Well No: WT-15A Time Sample Taken: 14:40

Well Total Depth: 24.87 Casing Head Elevation: 589.08

Depth to Water: 9.91 Elevation of Water Level: 579.17

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 14.96) x 3 =

Purge Volume 28.7 Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 17.3 °C; pH 6.57 ; Sp. Conductance 540 µS.

Intermed: Temperature 17.9 °C; pH 6.84 ; Sp. Conductance 560 µS.

Final: Temperature 17.7 °C; pH 6.90 ; Sp. Conductance 570 µS.
17.5 6.95 590

Pump\bailer depth: 23.0 feet.

Volume Purged: 30.0 gallons; Rate of Purge: 1.0 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: 0-2 gallons- light tint. 2-30 gallons- clear. Clear samples.

Sampler: Tim Sedosky
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

1ST QUARTER 1998

DRAFT

Quality Environmental Services

REI Consultants Inc.

Research, Environmental & Industrial Consultants, Inc.

P. O. Box 286 • Beaver, West Virginia 25813 • 1-304-255-2500
1-800-999-0105
FAX 1-304-255-2572

February 27, 1998

Mr. Dave Junker
Potesta & Associates, Inc.
University of Charleston, Cox Hall
2300 MacCorkle Avenue SE
Charleston WV 25304

RE: REIC Job #: 0298-58715

Dear Mr. Junker:

Please find enclosed your analysis report for the samples submitted to our laboratory on February 20, 1998 and February 25, 1998. Please note that the samples are identified as follows:

Client/Sampling Site:	Solutia, Inc.
Project No.:	97025.002
Custody No.'s:	1290, 1289 & 40898

Please do not hesitate to call if you have any questions.

Thank you.

Sincerely,

Ray Erickson
Vice President
REI Consultants, Inc.

enclosure
RE/pjm

MEMBER: American Chemical Society • Association of Official Analytical Chemists • Petroleum Marketers Association
Rural Water Association • Mining and Reclamation Association

POTESTA & ASSOCIATES, INC.
UNIVERSITY OF CHARLESTON, COX HALL
2300 MACCORKLE AVENUE SE
CHARLESTON WV 25304

REIC JOB #: 0298-58715
CLIENT/SAMPLING SITE: SOLUTIA, INC.
PROJECT NO.: 97025.002
CUSTODY NO.'S: 1290, 1289, & 40898

Prepared By:
REI Consultants, Inc.
P O Box 286
Beaver WV 25813

Phone: 304-255-2500
800-999-0105
Fax: 304-255-2572

POTESTA SAMPLE #: MW-1A **DATE SAMPLED:** 02-18-98
REIC SAMPLE #: 58715-1 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	ND	mg/l	8240B	0.005	02-23-98/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	92
toluene-d8	102
4-bromofluorobenzene	96

ND - None Detected at MQL
MQL - Minimum Quantifying Level

POTESTA SAMPLE #: MW-1B
REIC SAMPLE #: 58715-2

DATE SAMPLED: 02-18-98
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	ND	mg/l	8240B	0.005	02-23-98/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	94
toluene-d8	95
4-bromofluorobenzene	105

ND - None Detected at MQL
MQL - Minimum Quantifying Level

POTESTA SAMPLE #: MW-5A **DATE SAMPLED:** 02-18-98
REIC SAMPLE #: 58715-3 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	0.771	mg/l	8240B	0.005	02-24-98/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	95
toluene-d8	94
4-bromofluorobenzene	105

MQL - Minimum Quantifying Level

POTESTA SAMPLE #: MW-5B
REIC SAMPLE #: 58715-4

DATE SAMPLED: 02-18-98
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	3.60	mg/l	8240B	0.005	02-24-98/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	92
toluene-d8	104
4-bromofluorobenzene	99

MQL - Minimum Quantifying Level

POTESTA SAMPLE #: MW-20A **DATE SAMPLED:** 02-18-98
REIC SAMPLE #: 58715-5 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	3.58	mg/l	8240B	0.005	02-24-98/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	94
toluene-d8	105
4-bromofluorobenzene	96

MQL - Minimum Quantifying Level

POTESTA SAMPLE #: MW-20B **DATE SAMPLED:** 02-18-98
REIC SAMPLE #: 58715-6 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	1.33	mg/l	8240B	0.005	02-24-98/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	90
toluene-d8	103
4-bromofluorobenzene	99

MQL - Minimum Quantifying Level

POTESTA SAMPLE #: MW-22R **DATE SAMPLED:** 02-19-98
REIC SAMPLE #: 58715-7 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.012	mg/l	8240B	0.005	02-23-98/TC
trichloroethene	0.026	mg/l	8240B	0.005	02-23-98/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	92
toluene-d8	104
4-bromofluorobenzene	96

MQL - Minimum Quantifying Level

POTESTA SAMPLE #:	**MW-23A**	**DATE SAMPLED:**	**02-18-98**
REIC SAMPLE #:	**58715-8**	**MATRIX:**	**LIQUID**

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
trichloroethene	1.49	mg/l	8240B	0.005	02-24-98/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	93
toluene-d8	102
4-bromofluorobenzene	103

MQL - Minimum Quantifying Level

POTESTA SAMPLE #: MW-24A
REIC SAMPLE #: 58715-9

DATE SAMPLED: 02-19-98
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	1.62	mg/l	8240B	*0.250	02-24-98/TC
trichloroethene	2.06	mg/l	8240B	*0.250	02-24-98/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	92
toluene-d8	101
4-bromofluorobenzene	102

MQL - Minimum Quantifying Level
* - Elevated MQL due to sample matrix interference.

POTESTA SAMPLE #:	**MW-7**	**DATE SAMPLED:**	**02-19-98**
REIC SAMPLE #:	**58715-10**	**MATRIX:**	**LIQUID**

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	1.58	mg/l	8240B	0.005	02-24-98/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	91
toluene-d8	100
4-bromofluorobenzene	103

MQL - Minimum Quantifying Level

POTESTA SAMPLE #: MW-14 **DATE SAMPLED:** 02-18-98
REIC SAMPLE #: 58715-11 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	ND	mg/l	8240B	0.005	02-24-98/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	91
toluene-d8	104
4-bromofluorobenzene	99

ND - None Detected at MQL
MQL - Minimum Quantifying Level

POTESTA SAMPLE #: WT-14A **DATE SAMPLED:** 02-19-98
REIC SAMPLE #: 58715-12 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.352	mg/l	8240B	0.050	02-25-98/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	92
toluene-d8	99
4-bromofluorobenzene	97

SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	02-25-98/WP
2-chlorophenol	ND	mg/l	8270B	0.020	02-25-98/WP
2-nitrophenol	0.024	mg/l	8270B	0.020	02-25-98/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	02-25-98/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	02-25-98/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	02-25-98/WP
2,4,6-trichlorophenol	0.020	mg/l	8270B	0.020	02-25-98/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	02-25-98/WP
4-nitrophenol	ND	mg/l	8270B	0.020	02-25-98/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	02-25-98/WP
pentachlorophenol	ND	mg/l	8270B	0.020	02-25-98/WP
o-cresol	ND	mg/l	8270B	0.020	02-25-98/WP
m,p-cresol	ND	mg/l	8270B	0.040	02-25-98/WP
2,4,5-trichlorophenol	ND	mg/l	8270B	0.020	02-25-98/WP

Surrogates	% Recovery
2-fluorophenol	*3
phenol-d6	*1
2,4,6-tribromophenol	35

ND - None Detected at MQL
MQL - Minimum Quantifying Level
* - Surrogate recovery exceeds REIC control limits due to sample matrix interference.

POTESTA SAMPLE #: WT-14A **DATE SAMPLED:** 02-19-98
REIC SAMPLE #: 58715-12 **MATRIX:** LIQUID

GENERAL CHEMISTRY

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
Ammonia (as N)	29.5	mg/l	4500-NH_3 B&E	0.10	02-23-98/KM
Nitrate-Nitrite (as N)	58.0	mg/l	300	0.50	02-27-98/DM
Orthophosphate	0.44	mg/l	4500-P&E	0.05	02-23-98/RT
pH	7.67	SU	4500-H^+ B	NA	02-22-98/RT
Phosphorus	0.89	mg/l	4500-P B_5&E	0.05	02-24-98/RT
TKN (as N)	34.2	mg/l	351.3	0.10	02-24-98/KM

NA - Not Applicable
MQL - Minimum Quantifying Level
SU - Standard Units
TKN - Total Kjeldahl Nitrogen

POTESTA SAMPLE #: WT-15A
REIC SAMPLE #: 58715-13

DATE SAMPLED: 02-19-98
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.011	mg/l	8240B	0.005	02-25-98/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	86
toluene-d8	104
4-bromofluorobenzene	98

SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	02-25-98/WP
2-chlorophenol	ND	mg/l	8270B	0.020	02-25-98/WP
2-nitrophenol	ND	mg/l	8270B	0.020	02-25-98/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	02-25-98/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	02-25-98/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	02-25-98/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	02-25-98/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	02-25-98/WP
4-nitrophenol	ND	mg/l	8270B	0.020	02-25-98/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	02-25-98/WP
pentachlorophenol	ND	mg/l	8270B	0.020	02-25-98/WP
o-cresol	ND	mg/l	8270B	0.020	02-25-98/WP
m,p-cresol	ND	mg/l	8270B	0.040	02-25-98/WP
2,4,5-trichlorophenol	ND	mg/l	8270B	0.020	02-25-98/WP

Surrogates	% Recovery
2-fluorophenol	23
phenol-d6	20
2,4,6-tribromophenol	84

ND - None Detected at MQL
MQL - Minimum Quantifying Level

POTESTA SAMPLE #: WT-13A **DATE SAMPLED:** 02-19-98
REIC SAMPLE #: 58715-14 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	ND	mg/l	8240B	0.005	02-25-98/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	93
toluene-d8	104
4-bromofluorobenzene	98

POTESTA SAMPLE #: WT-13A **DATE SAMPLED:** 02-25-98
REIC SAMPLE #: 58715-14 **MATRIX:** LIQUID

SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	02-27-98/WP
2-chlorophenol	ND	mg/l	8270B	0.020	02-27-98/WP
2-nitrophenol	ND	mg/l	8270B	0.020	02-27-98/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	02-27-98/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	02-27-98/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	02-27-98/WP
2,4,6-trichlorophenol	0.056	mg/l	8270B	0.020	02-27-98/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	02-27-98/WP
4-nitrophenol	ND	mg/l	8270B	0.020	02-27-98/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	02-27-98/WP
pentachlorophenol	ND	mg/l	8270B	0.020	02-27-98/WP
o-cresol	ND	mg/l	8270B	0.020	02-27-98/WP
m,p-cresol	ND	mg/l	8270B	0.040	02-27-98/WP
2,4,5-trichlorophenol	ND	mg/l	8270B	0.020	02-25-98/WP

Surrogates	% Recovery
2-fluorophenol	64
phenol-d6	46
2,4,6-tribromophenol	108

ND - None Detected at MQL
MQL - Minimum Quantifying Level

POTESTA SAMPLE #: TD-5 **DATE SAMPLED:** 02-19-98
REIC SAMPLE #: 58715-15 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	ND	mg/l	8240B	0.005	02-25-98/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	92
toluene-d8	101
4-bromofluorobenzene	97

SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	02-25-98/WP
2-chlorophenol	ND	mg/l	8270B	0.020	02-25-98/WP
2-nitrophenol	ND	mg/l	8270B	0.020	02-25-98/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	02-25-98/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	02-25-98/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	02-25-98/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	02-25-98/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	02-25-98/WP
4-nitrophenol	ND	mg/l	8270B	0.020	02-25-98/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	02-25-98/WP
pentachlorophenol	ND	mg/l	8270B	0.020	02-25-98/WP
o-cresol	ND	mg/l	8270B	0.020	02-25-98/WP
m,p-cresol	ND	mg/l	8270B	0.040	02-25-98/WP
2,4,5-trichlorophenol	ND	mg/l	8270B	0.020	02-25-98/WP

Surrogates	% Recovery
2-fluorophenol	25
phenol-d6	19
2,4,6-tribromophenol	88

ND - None Detected at MQL
MQL - Minimum Quantifying Level

POTESTA SAMPLE #: TRIP BLANK **MATRIX:** LIQUID
REIC SAMPLE #: 58715-16

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	ND	mg/l	8240B	0.005	02-25-98/TC
trichloroethene	ND	mg/l	8240B	0.005	02-25-98/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	92
toluene-d8	104
4-bromofluorobenzene	99

ND - None Detected at MQL
MQL - Minimum Quantifying Level

DATE 2-27-98

APPROVED Ivan W Leef
Ivan W. Leef

Janet M Satterfield
Janet M. Satterfield

Potest· & Associates, Inc.
ENGINEERS AND ENVIRONMENTAL CONSULTANTS
University of Charleston, Cox Hall
2300 MacCorkle Ave. SE, Charleston, WV 25304
Tel: (304) 357-4990 FAX: (304) 357-4988

CHAIN OF CUSTODY RECORD
№ 1290
PAGE 1 OF 2

CLIENT/SAMPLING SITE: Solutia, Inc
ADDRESS: 1 Monsanto Rd.
CITY/STATE/ZIP: Nitro, WV 25143
PROJECT NO.: 97025.002 DATE: 2-20-98
CONTACT PERSON: Dave Junker - Potesta
TELEPHONE/FAX: 304-357-4990 / 304-357-4988
SAMPLER: D. Junker, Chris Henderson
HOW SHIPPED: Courier — REIC Labs

SAMPLE LOG AND ANALYSIS REQUESTED

TURNAROUND TIME
X REGULAR
RUSH

PRESERVATIVES
0 NO PRESERVATIVE
1 HYDROCHLORIC ACID
2 NITRIC ACID
3 SULFURIC ACID
4 SODIUM THIOSULFATE
5 SODIUM HYDROXIDE
6 ZINC ACETATE
7 EDTA

PRESERVATIVE CODES

SAMPLE ID	NO. & TYPE OF CONTAINERS	DATE/TIME	MATRIX	SAMPLE COMP/GRAB	ANALYSIS REQUESTED & METHOD: TCE	Benzene	Phenols									REMARKS
MW-1A	2-40ml	2-18-98 1205	Liq	Grab	X	X										Benzene MQL 0.005
MW-1B	"	2-18-98 1235	"	"	X											TCE MQL 0.005
MW-5A	"	2-18-98 1700	"	"	X											
MW-5B	"	2-18-98 1700	"	"	X											
MW-20A	"	2-18-98 1600	"	"	X											
MW-20B	"	2-18-98 1610	"	"	X											
MW-22R	"	2-19-98 1215	"	"	X	X										
MW-23A	"	2-18-98 1500	"	"	X											
MW-24A	"	2-19-98 1522	"	"	X	X										
MW-7	"	2-19-98 1135	"	"		X										
MW-14	"	2-18-98 1420	"	"		X										

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
David N. Junker	2-20-98 3:50	[signature]	[signature]	4:30 2/20/98	

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	CONDITION ON ARRIVAL:
		Jeanette Kettle	2/20/98 @ 4:15	OK 4.0°C

COMMENTS REIC LAB - Billing direct to Tony Tuk @ Solutia, Inc.
Results Copy to Dave Junker @ Potesta + Assoc.

Potesta & Associates, Inc.
ENGINEERS AND ENVIRONMENTAL CONSULTANTS
University of Charleston, Cox Hall
2300 MacCorkle Ave. SE, Charleston, WV 25304
Tel: (304) 357-4990 FAX: (304) 357-4988

CHAIN OF CUSTODY RECORD
№ 1289
PAGE 2 OF 2

CLIENT/SAMPLING SITE: Solutia, Inc
ADDRESS: 1 Monsanto Rd.
CITY/STATE/ZIP: Nitro, WV 25143
PROJECT NO.: 97025.002 DATE: 2-20-98
CONTACT PERSON: Dave Junker - Poteste & Assoc.
TELEPHONE/FAX: 304-357-4990 / 304-357-4988
SAMPLER: D. Junker - C. Henderson
HOW SHIPPED: Courier to REIC Lab.

SAMPLE LOG AND ANALYSIS REQUESTED

TURNAROUND TIME: X REGULAR ___ RUSH

PRESERVATIVES
0 NO PRESERVATIVE
1 HYDROCHLORIC ACID
2 NITRIC ACID
3 SULFURIC ACID
4 SODIUM THIOSULFATE
5 SODIUM HYDROXIDE
6 ZINC ACETATE
7 EDTA

ANALYSIS REQUESTED & METHOD / PRESERVATIVE CODES

SAMPLE ID	NO. & TYPE OF CONTAINERS	DATE/TIME	MATRIX	SAMPLE COMP/GRAB	TCE	Benzene	Phenols	Nutrient Analy.	REMARKS
WT-14A	2-40ml + Kit	2-19-98 0925	Liq	Grab	X	X	X		Phenols MQL 0.02
WT-15A	2-40ml 1-G Ltr.	2-19-98 1030	"	"	X	X			Include: o-cresol
WT-13A	"	2-19-98 1100	"	"	X	X			M,p-cresol
TD-5	"	2-19-98 0900	"	"	X	X			

Nutrient Analysis
Ammonia Orthophos.
TKN, pH, Nitrates/
Nitrite, Total Phos.

RELINQUISHED BY:(SIGNATURE)	DATE/TIME	RECEIVED BY:(SIGNATURE)	RELINQUISHED BY:(SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
David M. Junker	2-20-98 3:00	[signature]	[signature]	2/20/98 4:30	

RELINQUISHED BY:(SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY:(SIGNATURE)	DATE/TIME	CONDITION ON ARRIVAL:
		Juanita Ritter	2/20/98 @ 4:15	OK 4.0°C

COMMENTS REIC Lab - Invoice Tony Tuk @ Solutia, Inc.
sults copy to D. Junker - Pot. & Assoc.

REIC

CHAIN OF CUSTODY RECORD NO. 408

REIC Laboratory
225 Industrial Park Rd.
P.O. Box 286, Beaver, WV 25813
Phone: 304-255-2500 or 800-999-0105
FAX: 304-255-2572

CLIENT: Solutia, Inc.
ADDRESS: 1 Monsanto Rd.
CITY/STATE/ZIP: Nitro, WV. 25143
BILL TO: Tony Tuk - Solutia
CITY/STATE/ZIP: as above

CONTACT PERSON: D. Junker / Potesta
TELEPHONE/FAX: 357-4990 / 357-4988
SITE ID & STATE: Solutia, Performance Moni
PROJECT ID: 97025.002
SAMPLER: D. Junker

SAMPLE LOG AND ANALYSIS REQUEST

TURNAROUND TIME REQUIREMENTS
REGULAR: X
*RUSH: ___ 5-Day ___ 3-Day ___ 2-Day ___ 1-Day
*Rush work needs prior Laboratory approval and will include surcharges

PRESERVATIVES
0 No Preservative
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide
6 Zinc Acetate
7 EDTA

PRESERVATIVE CODES: 1, 0

ANALYSIS REQUESTED & METHOD: Benzene, Phenols

SAMPLE ID	NO. & TYPE OF CONTAINERS	SAMPLING DATE / TIME	MATRIX	SAMPLE COMP / GRAB	Benzene	Phenols	COMMENTS
WT-13A	2-40 ml 1-Ltr(G)	2-25-98 0900	Liq	Grab.	X	X	Phenols MQL = 0.02
							Include - o-cresol
							m-p-cresol
							Benzene MQL = 0.005
							Copy of results to
							D. Junker at
							Potesta Associates

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
David N. Junker	2-25-98 2:46	[signature]	2/25/98 3:46	[signature]	2/25/98 4:25	[signature]	2/25/98 4:25

Special Requests:

Shipment: Hand-Del: Courier: UPS: FedEx: Shipment Date: FAX Results: Y N

POTESTA & ASSOCIATES

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 2-18-98

Well No: MW-1A Sample Collection Time: 12:05

Well Total Depth: 32' Casing Head Elevation: 594.37

Depth to Water: 19.52 Elevation of Water Level: 574.85

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 12.48) x 3 =

Purge Volume 6.4 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 15.9 °C; pH 6.8 ; Sp. Conductance 380 μs.

Intermed: Temperature 16.8 °C; pH 6.75; Sp. Conductance 370 μs.

Final: Temperature 16.4 °C; pH 6.71; Sp. Conductance 360 μs.

Pump depth: 30 feet.

Volume Purged: 12 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments:

Sampler: Dave Junker and Chris Henderson
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Monitoring Well Sampling Report

Well Location: **Solutia Performance Monitoring** Date: 2-18-98

Well No: MW-1B Sample Collection Time: 12:35

Well Total Depth: 55' Casing Head Elevation: 594.38

Depth to Water: 19.61 Elevation of Water Level: 574.77

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 35.4) x 3 =

Purge Volume 18 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 16.7 °C; pH 6.79 ; Sp. Conductance 410 µs.

Intermed: Temperature 16.6 °C; pH 6.64 ; Sp. Conductance 430 µs.

Final: Temperature 16.5 °C; pH 6.69 ; Sp. Conductance 430 µs.

Pump depth: 40.0 feet.

Volume Purged: 15 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody.

Comments:

Sampler: Dave Junker and Chris Henderson
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 2-18-98

Well No: MW-5A Sample Collection Time: 17:00

Well Total Depth: 33.0 Casing Head Elevation: 594.65

Depth to Water: 27.65 Elevation of Water Level: 567.00

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 5.4) x 3 =

Purge Volume 2.7 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 17.9 °C; pH 6.16; Sp. Conductance 495 µs.

Intermed: Temperature 19.0 °C; pH 6.10; Sp. Conductance 510 µs.

Final: Temperature 18.7 °C; pH 6.05; Sp. Conductance 500 µs.

Pump depth: 32.0 feet.

Volume Purged: 6 gallons; Rate of Purge: ____ gal/min.

Sample Protocol: See Chain-of-Custody

Comments:

Sampler: Dave Junker and Chris Henderson
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 2-18-98

Well No: MW-5B Sample Collection Time: 17:00

Well Total Depth: 56.0 Casing Head Elevation: 594.97

Depth to Water: 28.00 Elevation of Water Level: 566.97

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 28) x 3 =

Purge Volume 14.3 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 18.0 °C; pH 6.20; Sp. Conductance 840 µs.

Intermed: Temperature 18.2 °C; pH 6.14; Sp. Conductance 1080 µs.

Final: Temperature 18.7 °C; pH 6.05; Sp. Conductance 1155 µs.

Pump depth: 40 feet.

Volume Purged: 12 gallons; Rate of Purge: ____ gal/min.

Sample Protocol: See Chain-of-Custody

Comments:

Sampler: Dave Junker and Chris Henderson
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 2-19-98

Well No: MW-7 Sample Collection Time: 11:35

Well Total Depth: 31.66 Casing Head Elevation: 594.03

Depth to Water: 26.09 Elevation of Water Level: 567.94

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 5.6) x 3 =

Purge Volume 2.8 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer X or Pump ____

Initial: Temperature 16.0 °C; pH 6.85; Sp. Conductance 515 µS.

Intermed: Temperature 16.1 °C; pH 6.78; Sp. Conductance 520 µS.

Final: Temperature ____ °C; pH ____; Sp. Conductance ____ µS.

Pump depth: TD feet.

Volume Purged: 2.2 gallons; Rate of Purge: 0.3 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Well contains kerosene product 1" - Boiled dry
Sampled first recovery.

Sampler: Dave Junker and Chris Henderson

SWL - Static Water Level

Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 2-18-98

Well No: MW-14 Sample Collection Time: 14:20

Well Total Depth: 30.43 Casing Head Elevation: 593.57

Depth to Water: 16.43 Elevation of Water Level: 577.14

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 14) x 3 =

Purge Volume 7.1 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 14.9 °C; pH 6.91; Sp. Conductance 215 µs.

Intermed: Temperature 15.2 °C; pH 6.91; Sp. Conductance 215 µs.

Final: Temperature 15.1 °C; pH 6.92; Sp. Conductance 220 µs.

Pump depth: 28.0 feet.

Volume Purged: 9 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments:

Sampler: Dave Junker and Chris Henderson

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 2-18-98

Well No: MW-20A Sample Collection Time: 16:00

Well Total Depth: 40.0 Casing Head Elevation: 596.09

Depth to Water: 28.98 Elevation of Water Level: 567.11

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 11.0) x 3 =

Purge Volume 5.6 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 14.8 °C; pH 7.02; Sp. Conductance 750 µs.

Intermed: Temperature ____ °C; pH ____; Sp. Conductance ____ µs.

Final: Temperature ____ °C; pH ____; Sp. Conductance ____ µs.

Pump depth: 39.0 feet.

Volume Purged: 2.5 gallons; Rate of Purge: 0.2 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Purged dry - Sampled first recovery.

Sampler: Dave Junker and Chris Henderson
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Monitoring Well Sampling Report

Well Location: **Solutia Performance Monitoring** Date: 2-19-98

Well No: MW-22R Sample Collection Time: 12:15

Well Total Depth: 40.0 Casing Head Elevation: 596.76

Depth to Water: 23.52 Elevation of Water Level: 573.24

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 16.5) x 3 =

Purge Volume 31.6 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 16.65°C; pH 6.76; Sp. Conductance 1420μs.

Intermed: Temperature 17.3 °C; pH 6.76; Sp. Conductance 1280μs.

Final: Temperature 17.8 °C; pH 6.81; Sp. Conductance 1250μs.

Pump depth: 39.0 feet.

Volume Purged: 14 gallons; Rate of Purge: 0.3 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Water clean

Sampler: Dave Junker and Chris Henderson
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Monitoring Well Sampling Report

Well Location: **Solutia Performance Monitoring** Date: 2-18-98

Well No: MW-23A Sample Collection Time: 15:00

Well Total Depth: 35.0 Casing Head Elevation: 598.82

Depth to Water: 28.24 Elevation of Water Level: 570.58

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 6.8) x 3 =

Purge Volume 13.0 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 16.5 °C; pH 7.07; Sp. Conductance 910 µS.

Intermed: Temperature 16.5 °C; pH 7.09; Sp. Conductance 890 µS.

Final: Temperature 16.5 °C; pH 7.12; Sp. Conductance 895 µS.

Pump depth: 34.0 feet.

Volume Purged: 5 gallons; Rate of Purge: 0.2 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Purged dry - Sampled first Recovery

Sampler: Dave Junker and Chris Henderson
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Monitoring Well Sampling Report

Well Location: **Solutia Performance Monitoring** Date: 2-18-98

Well No: MW-20B Sample Collection Time: 16:10

Well Total Depth: 57.0 Casing Head Elevation: 596.76

Depth to Water: 28.54 Elevation of Water Level: 568.22

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 28.46) x 3 =

Purge Volume 14.5 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 18.3 °C; pH 6.72 ; Sp. Conductance 560 ms.

Intermed: Temperature 18.2 °C; pH 6.48 ; Sp. Conductance 1220ms.

Final: Temperature 18.3 °C; pH 6.39 ; Sp. Conductance 1530ms.
18.3 6.21 1555

Pump depth: 40.0 feet.

Volume Purged: ____ gallons; Rate of Purge: ____ gal/min.

Sample Protocol: See Chain-of-Custody

Comments: First 3 gallons clear - water turned brown to finish Purge.

Sampler: Dave Junker and Chris Henderson
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates

Monitoring Well Sampling Report

Well Location: **Solutia Performance Monitoring** Date: 2-19-98

Well No: MW-24A Sample Collection Time: 15:22

Well Total Depth: 35' Casing Head Elevation: 594.58

Depth to Water: 27.32 Elevation of Water Level: 567.26

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 7.68) x 3 =

Purge Volume 14.7 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ___ or Pump x

Initial: Temperature 17.1 °C; pH 6.95; Sp. Conductance 1220 µS.

Intermed: Temperature 16.4 °C; pH 6.98; Sp. Conductance 830 µS.

Final: Temperature 16.2 °C; pH 6.97; Sp. Conductance 845 µS.

Pump depth: 34.6 feet.

Volume Purged: 11 gallons; Rate of Purge: 0.2 gal/min.

Sample Protocol: See Chain-of-custody

Comments: Water dark and smelly through sampling.

Used respirator and Tyvec suit

Sampler: Dave Junker and Chris Henderson

SWL - Static Water Level

Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Monitoring Well Sampling Report

Well Location: **Solutia Performance Monitoring** Date: 2-19-98

Well No: TD-5 Sample Collection Time: 09:00

Well Total Depth: 30.4 Casing Head Elevation: 589.49

Depth to Water: 21.13 Elevation of Water Level: 568.36

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.17 x (Well T.D.-SWL 9.3) x 3 =

Purge Volume 4.7 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 14.8 °C; pH 6.50; Sp. Conductance 580 μs.

Intermed: Temperature 15.1 °C; pH 6.42; Sp. Conductance 620 μs.

Final: Temperature 14.9 °C; pH 6.51; Sp. Conductance 610 μs.

Pump depth: 29.0 feet.

Volume Purged: 9 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments:

Sampler: Dave Junker and Chris Henderson
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 2-19-98

Well No: WT-13A Sample Collection Time: 11:00

Well Total Depth: 35.06 Casing Head Elevation: 590.82

Depth to Water: 22.65 Elevation of Water Level: 568.17

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 12.4) x 3 =

Purge Volume 24 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 15.6 °C; pH 6.03; Sp. Conductance 500 µs.

Intermed: Temperature 16.0 °C; pH 6.25; Sp. Conductance 510 µs.

Final: Temperature 16.1 °C; pH 6.03; Sp. Conductance 515 µs.

Pump depth: 34.0 feet.

Volume Purged: 10 gallons; Rate of Purge: 0.4 gal/min.

Sample Protocol: See Chain-of-Custody

Comments:

Sampler: Dave Junker and Chris Henderson
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Monitoring Well Sampling Report

Well Location: **Solutia Performance Monitoring** Date: 2-19-98

Well No: WT-14A Sample Collection Time: 09:25

Well Total Depth: 29.29 Casing Head Elevation: 593.57

Depth to Water: 21.62 Elevation of Water Level: 571.95

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.64 x (Well T.D.-SWL 7.7) x 3 =

Purge Volume 14.7 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 15.7 °C; pH 6.5 ; Sp. Conductance 3530µs.

Intermed: Temperature 16.3 °C; pH 6.89; Sp. Conductance 3830µs.

Final: Temperature 16.1 °C; pH 6.78; Sp. Conductance 3790µs.

Pump depth: 28.5 feet. (Because of bailer)

Volume Purged: 12 gallons; Rate of Purge: 0.4 gal/min.

Sample Protocol: See Chain-of-Custody

Comments:

Sampler: Dave Junker and Chris Henderson

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

POTESTA & ASSOCIATES

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 2-19-98

Well No: WT-15A Sample Collection Time: 10:30

Well Total Depth: 24.87 Casing Head Elevation: 589.08

Depth to Water: 9.35 Elevation of Water Level: 579.73

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: 0.65 x (Well T.D.-SWL 15.5) x 3 =

Purge Volume 29.0 Gallons.

See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 13.1 °C; pH 6.31; Sp. Conductance 415 µS.

Intermed: Temperature 13.2 °C; pH 6.17; Sp. Conductance 385 µS.

Final: Temperature 14.3 °C; pH 6.18; Sp. Conductance 370 µS.

Pump depth: 23' feet.

Volume Purged: 12.0 gallons; Rate of Purge: 0.7 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Water rusty color first 5 gal. - cleared for sample

Sampler: Dave Junker and Chris Henderson

SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

2ND QUARTER 1998

DRAFT

REIConsultants, Inc.

PROFESSIONAL ENVIRONMENTAL CONSULTING SERVICES PERFORMED FOR:

SOLUTIA

RECEIVED

JUL 13 1998

REIC Job #	L62366
Project ID:	97025.002
Custody #:	1513
Site ID:	SOLUTIA INC
Date Submitted:	29-JUN-98

REIConsultants, Inc.

L62366

SOLUTIA

Client Sample ID: MW-1A

REIC Sample ID: L62366-1

Client Project ID: 97025.002

Sample Date: 25-JUN-98

Matrix: Liquid

Custody #: 1513

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
trichloroethylene	ND	mg/l	8240B	0.005	30-JUN-98	TC

SOLUTIA

Client Sample ID: MW-1B
REIC Sample ID: L62366-2
Client Project ID: 97025.002

Sample Date: 25-JUN-98
Matrix: Liquid
Custody #: 1513

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
trichloroethylene	ND	mg/l	8240B	0.005	01-JUL-98	TC

SOLUTIA

Client Sample ID: MW-5A
REIC Sample ID: L62366-3
Client Project ID: 97025.002

Sample Date: 25-JUN-98
Matrix: Liquid
Custody #: 1513

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
trichloroethylene	0.776	mg/l	8240B	0.005	01-JUL-98	TC

SOLUTIA

Client Sample ID: MW-5B

REIC Sample ID: L62366-4

Client Project ID: 97025.002

Sample Date: 25-JUN-98

Matrix: Liquid

Custody #: 1513

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
trichloroethylene	1.69	mg/l	8240B	0.005	02-JUL-98	TC

SOLUTIA

Client Sample ID:	MW-20A	Sample Date:	25-JUN-98
REIC Sample ID:	L62366-5	Matrix:	Liquid
Client Project ID:	97025.002	Custody #:	1513

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
trichloroethylene	0.836	mg/l	8240B	0.005	01-JUL-98	TC

REIConsultants, Inc.

L62366

SOLUTIA

Clie ;ample ID:	MW-20B	Sample Date:	25-JUN-98
RE ample ID:	L62366-6	Matrix:	Liquid
Cl :t Project ID:	97025.002	Custody #:	1513

Par eter	Result	Units	Method	MQL	Analyzed	By
		VOLATILE ORGANIC COMPOUNDS				
tric :ethylene	2.92	mg/l	8240B	0.005	02-JUL-98	TC

REIConsultants, Inc.

L62366

SOLUTIA

Client Sample ID: MW-23A
REIC Sample ID: L62366-7
Client Project ID: 97025.002

Sample Date: 25-JUN-98
Matrix: Liquid
Custody #: 1513

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
trichloroethylene	2.63	mg/l	8240B	0.005	02-JUL-98	TC

SOLUTIA

Client Sample ID: MW-22R
REIC Sample ID: L62366-8
Client Project ID: 97025.002

Sample Date: 25-JUN-98
Matrix: Liquid
Custody #: 1513

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
benzene	0.007	mg/l	8240B	0.005	03-JUL-98	TC
trichloroethylene	0.029	mg/l	8240B	0.005	03-JUL-98	TC

SOLUTIA

Client Sample ID: MW-24A
REIC Sample ID: L62366-9
Client Project ID: 97025.002

Sample Date: 26-JUN-98
Matrix: Liquid
Custody #: 1513

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
benzene	0.342	mg/l	8240B	0.005	03-JUL-98	TC
trichloroethylene	0.102	mg/l	8240B	0.005	03-JUL-98	TC

REIConsultants, Inc.

L62366

SOLUTIA

Client Sample ID:	MW-7	Sample Date:	26-JUN-98
REIC Sample ID:	L62366-10	Matrix:	Liquid
Client Project ID:	97025.002	Custody #:	1513

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
benzene	3.03	mg/l	8240B	0.250	02-JUL-98	TC

SOLUTIA

Client Sample ID: MW-14
REIC Sample ID: L62366-11
Client Project ID: 97025.002

Sample Date: 25-JUN-98
Matrix: Liquid
Custody #: 1513

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
benzene	ND	mg/l	8240B	0.005	02-JUL-98	TC

SOLUTIA

Client Sample ID: TD-5

REIC Sample ID: L62366-12

Client Project ID: 97025.002

Sample Date: 26-JUN-98

Matrix: Liquid

Custody #: 1514

Parameter	Result	Units	Method	MQL	Analyzed	By
SEMI-VOLATILE ORGANIC COMPOUNDS						
2,4,5-trichlorophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2-chlorophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2-nitrophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
4-nitrophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
m,p-cresol	ND	mg/l	8270B	0.020	06-JUL-98	WP
o-cresol	ND	mg/l	8270B	0.020	06-JUL-98	WP
pentachlorophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
phenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
VOLATILE ORGANIC COMPOUNDS						
benzene	ND	mg/l	8240B	0.005	03-JUL-98	TC

SOLUTIA

Client Sample ID: WT-13A
REIC Sample ID: L62366-13
Client Project ID: 97025.002

Sample Date: 26-JUN-98
Matrix: Liquid
Custody #: 1514

Parameter	Result	Units	Method	MQL	Analyzed	By
SEMI-VOLATILE ORGANIC COMPOUNDS						
2,4,5-trichlorophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2-chlorophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2-nitrophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
4-nitrophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
m,p-cresol	ND	mg/l	8270B	0.020	06-JUL-98	WP
o-cresol	ND	mg/l	8270B	0.020	06-JUL-98	WP
pentachlorophenol	ND	mg/l	8270B	0.020	06-JUL-98	W
phenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
VOLATILE ORGANIC COMPOUNDS						
benzene	ND	mg/l	8240B	0.005	03-JUL-98	TC

SOLUTIA

Client Sample ID: WT-15A
REIC Sample ID: L62366-14
Client Project ID: 97025.002

Sample Date: 26-JUN-98
Matrix: Liquid
Custody #: 1514

Parameter	Result	Units	Method	MQL	Analyzed	By
SEMI-VOLATILE ORGANIC COMPOUNDS						
2,4,5-trichlorophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2-chlorophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2-nitrophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
4-nitrophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
m,p-cresol	ND	mg/l	8270B	0.020	06-JUL-98	WP
o-cresol	ND	mg/l	8270B	0.020	06-JUL-98	WP
pentachlorophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
phenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
VOLATILE ORGANIC COMPOUNDS						
benzene	0.008	mg/l	8240B	0.005	06-JUL-98	TC

REIConsultants, Inc.

L62366

SOLUTIA

Client Sample ID: WT-14A

REIC Sample ID: L62366-15

Client Project ID: 97025.002

Sample Date: 26-JUN-98

Matrix: Liquid

Custody #: 1514

Parameter	Result	Units	Method	MQL	Analyzed	By
GENERAL CHEMISTRY						
Ammonia Nitrogen	52.2	mg/l	4500-NH3B&E	1.0	06-JUL-98	KM
Nitrate	6.87	mg/l	300	0.10	07-JUL-98	MS
Nitrite	ND	mg/l	300	0.50	07-JUL-98	MS
Orthophosphate	0.19	mg/l	4500-P&E	0.05	30-JUN-98	DM
pH	7.83	SU	4500-H+ B	NA	30-JUN-98	RT
TKN	67.8	mg/l	351.3	1.0	01-JUL-98	KM
Total Phosphate	0.71	mg/l	4500-P B5 E	0.05	30-JUN-98	DM
SEMI-VOLATILE ORGANIC COMPOUNDS						
2,4,5-trichlorophenol	0.102	mg/l	8270B	0.020	06-JUL-98	WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2,4-dichlorophenol	0.024	mg/l	8270B	0.020	06-JUL-98	WP
2,4-dimethylphenol	0.182	mg/l	8270B	0.020	06-JUL-98	WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2-chlorophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
2-nitrophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
4-chloro-3-methylphenol	0.181	mg/l	8270B	0.020	06-JUL-98	WP
4-nitrophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
m,p-cresol	1.72	mg/l	8270B	0.020	06-JUL-98	WP
o-cresol	0.113	mg/l	8270B	0.020	06-JUL-98	WP
pentachlorophenol	ND	mg/l	8270B	0.020	06-JUL-98	WP
phenol	0.108	mg/l	8270B	0.020	06-JUL-98	WP
VOLATILE ORGANIC COMPOUNDS						
benzene	0.478	mg/l	8240B	0.005	06-JUL-98	TC

Abbreviations Key

ANA - Analysis Not Available
BTU - British Thermal Units
DRO - Diesel Range Organics
GRO - Gasoline Range Organics
KRO - Kerosene Range Organics
MDL - Method Detection Limit
MQL - Minimum Quantifying Level
NA - Not Applicable
ND - None Detected at MQL
NTU - Nephelometric Turbidity Units
ORO - Oil Range Organics
SU - Standard Units
TPH - Total Petroleum Hydrocarbons
TKN - Total Kjeldahl Nitrogen
TS - Total Solids
TSS - Total Suspended Solids
VSS - Volatile Suspended Solids

Date: 7-8-98 Approved: [signature]
Inorganic Department Manager

Date: 7-8-98 Approved: Janet M Satterfield
Organic Department Manager

Date: 7-8-98 Approved: [signature]
Vice-President

Appendix A - Quality Control Summary

Method	Surrogate	% Recovery
	L62366-1	
8240B	1,2-dichloroethane-d4	102
8240B	4-bromofluorobenzene	103
8240B	toluene-d8	97
	L62366-2	
8240B	1,2-dichloroethane-d4	95
8240B	4-bromofluorobenzene	102
8240B	toluene-d8	98
	L62366-3	
8240B	1,2-dichloroethane-d4	105
8240B	4-bromofluorobenzene	103
8240B	toluene-d8	98
	L62366-4	
8240B	1,2-dichloroethane-d4	102
8240B	4-bromofluorobenzene	99
8240B	toluene-d8	99
	L62366-5	
8240B	1,2-dichloroethane-d4	116
8240B	4-bromofluorobenzene	103
8240B	toluene-d8	97
	L62366-6	
8240B	1,2-dichloroethane-d4	112
8240B	4-bromofluorobenzene	100
8240B	toluene-d8	101
	L62366-7	
8240B	1,2-dichloroethane-d4	100
8240B	4-bromofluorobenzene	99
8240B	toluene-d8	100
	L62366-8	
8240B	1,2-dichloroethane-d4	103
8240B	4-bromofluorobenzene	101
8240B	toluene-d8	99
	L62366-9	
8240B	1,2-dichloroethane-d4	96
8240B	4-bromofluorobenzene	99
8240B	toluene-d8	95

Appendix A - Quality Control Summary

Method	Surrogate	% Recovery
L62366-10		
8240B	1,2-dichloroethane-d4	101
8240B	4-bromofluorobenzene	104
8240B	toluene-d8	96
L62366-11		
8240B	1,2-dichloroethane-d4	109
8240B	4-bromofluorobenzene	103
8240B	toluene-d8	98
L62366-12		
8240B	1,2-dichloroethane-d4	102
8240B	4-bromofluorobenzene	113
8240B	toluene-d8	100
8270B	2,4,6-tribromophenol	100
8270B	2-fluorophenol	33
8270B	phenol-d6	61
L62366-13		
8240B	1,2-dichloroethane-d4	97
8240B	4-bromofluorobenzene	105
8240B	toluene-d8	103
8270B	2,4,6-tribromophenol	121
8270B	2-fluorophenol	28
8270B	phenol-d6	49
L62366-14		
8240B	1,2-dichloroethane-d4	106
8240B	4-bromofluorobenzene	109
8240B	toluene-d8	101
8270B	2,4,6-tribromophenol	111
8270B	2-fluorophenol	26
8270B	phenol-d6	65
L62366-15		
8240B	1,2-dichloroethane-d4	84
8240B	4-bromofluorobenzene	103
8240B	toluene-d8	100
8270B	2,4,6-tribromophenol	102
8270B	2-fluorophenol	35
8270B	phenol-d6	64

Potest & Associates, Inc.
ENGINEERS AND ENVIRONMENTAL CONSULTANTS
University of Charleston, Cox Hall
2300 MacCorkle Ave. SE, Charleston, WV 25304
Tel: (304) 357-4990 FAX: (304) 357-4988

CHAIN OF CUSTODY RECORD

№ 1513

PAGE 1 OF 2

CLIENT/SAMPLING SITE: Solutia, Inc

CONTACT PERSON: D. Junker - Potesta + Assoc.

ADDRESS: 1 Monsanto Rd.

TELEPHONE/FAX: 357-4990 / 357-4988

CITY/STATE/ZIP: Nitro, WV. 25143

SAMPLER: D. Junker

PROJECT NO.: 97025.002 DATE: 6-29-98

HOW SHIPPED: REIC Courier

SAMPLE LOG AND ANALYSIS REQUESTED

TURNAROUND TIME: X REGULAR ___ RUSH

PRESERVATIVES: 0 NO PRESERVATIVE; 1 HYDROCHLORIC ACID; 2 NITRIC ACID; 3 SULFURIC ACID; 4 SODIUM THIOSULFATE; 5 SODIUM HYDROXIDE; 6 ZINC ACETATE; 7 EDTA

PRESERVATIVE CODES: 1, 1, 0, 0

ANALYSIS REQUESTED & METHOD: TCE, Benzene, Phenols, Semi-Vols

SAMPLE ID	NO. & TYPE OF CONTAINERS	DATE/TIME	MATRIX	SAMPLE COMP/GRAB	TCE	Benzene	Phenols	Semi-Vols					REMARKS
MW-1A	2-40ml	6-25-98 1045	Liq	Grab	X								Benzene MQL 0.005
MW-1B	"	6-25-98 1130	"	"	X								TCE MQL 0.005
MW-5A	"	6-25-98 1600	"	"	X								
MW-5B	"	6-25-98 1645	"	"	X								
MW-20A	"	6-25-98 1300	"	"	X								
MW-20B	"	6-25-98 1430	"	"	X								
MW-23A	"	6-25-98 1500	"	"	X								
MW-22B	"	6-25-98 1720	"	"	X	X							
MW-24A	"	6-26-98 1455	"	"	X	X							
MW-7	"	6-26-98 1410	"	"		X							
MW-14	"	6-25-98 1220	"	"		X							

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
David N. Junker	6-29-98 2:30	[signature]	[signature]	5:00 6/29/98	[signature]

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	CONDITION ON ARRIVAL:
		[signature]	540 6/29/98	ok 4° iced

COMMENTS: Analysis by REIC Laboratory - Billing to Tony Tuk of Solutia, Inc.
Copy of results to D. Junker of Potesta + Associates Fax 357-4988

Potesta & Associates, Inc.
ENGINEERS AND ENVIRONMENTAL CONSULTANTS
University of Charleston, Cox Hall
2300 MacCorkle Ave. SE, Charleston, WV 25304
Tel: (304) 357-4990 FAX: (304) 357-4988

CHAIN OF CUSTODY RECORD

№ 1514

PAGE 2 OF 2

CLIENT/SAMPLING SITE: Solutia, Inc
ADDRESS: 1 Monsanto Rd.
CITY/STATE/ZIP: Nitro, W.V. 25143
PROJECT NO.: 97025.002 DATE: 6-29-98

CONTACT PERSON: D. Junker - Potesta + Assoc.
TELEPHONE/FAX: 357-4990 / 357-4988
SAMPLER: D. Junker
HOW SHIPPED: REIC Courier

SAMPLE LOG AND ANALYSIS REQUESTED

TURNAROUND TIME: X REGULAR ___ RUSH

PRESERVATIVES
0 NO PRESERVATIVE
1 HYDROCHLORIC ACID
2 NITRIC ACID
3 SULFURIC ACID
4 SODIUM THIOSULFATE
5 SODIUM HYDROXIDE
6 ZINC ACETATE
7 EDTA

PRESERVATIVE CODES / ANALYSIS REQUESTED & METHOD

SAMPLE ID	NO. & TYPE OF CONTAINERS	DATE/TIME	MATRIX	SAMPLE COMP/GRAB	TCE (1)	Benzene (1)	Phenols (0)	Semi-Vols (0)	Nutrient Analy (0)					REMARKS
TD-5	1-G. Liter 2-40 ml	6-26-98 0930	Liq	Grab	X	X	X							MQL 0.02 / Include o-cresol +
WT-13A	"	6-26-98 1215	"	"	X	X	X							mp-cresol
WT-15A	"	6-26-98 1130	"	"	X	X	X							
WT-14A	1-G Liter 2-40 ml 2-0. Liters	6-26-98 1020	"	"	X	X	X	X						

Nutrient Analysis
Ammonia, ortho-phos
TKN, pH, Nitrates an
Nitrites, Total Phosp
ates

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
David Junker	6-29-98 2:30	[signature]	[signature]	6/29/98 5:00	

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	CONDITION ON ARRIVAL:
		[signature]	6-29-98 5:00	OK 4° Iced

COMMENTS Analysis by REIC Laboratory + Billing to Tony Tuck of Solutia, Inc.
C 1 of results to D. Junker of Pote + Assoc. Fax 357-4988

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 06-25-98

Well No: MW-1A Time Sample Taken: 1045

Well Total Depth: 32.0 Casing Head Elevation: 594.37

Depth to Water: 18.61 Elevation of Water Level: 575.76

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 21.0 °C; pH 6.22 ; Sp. Conductance 590 µS.

Intermed: Temperature 18.7 °C; pH 6.85 ; Sp. Conductance 630 µS.

Final: Temperature 19.9 °C; pH 6.81 ; Sp. Conductance 610 µS.

Pump\bailer depth: 30.0 feet.

Volume Purged: 12.0 gallons; Rate of Purge: 0.4 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ______

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: **Solutia Performance Monitoring** Date: 06-25-98

Well No: MW-1B Time Sample Taken: 1130

Well Total Depth: 55.0 Casing Head Elevation: 594.38

Depth to Water: 18.72 Elevation of Water Level: 575.66

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 19.0 °C; pH 7.15 ; Sp. Conductance 650 µS.

Intermed: Temperature 19.1 °C; pH 6.66 ; Sp. Conductance 730 µS.

Final: Temperature 19.5 °C; pH 6.71 ; Sp. Conductance 700 µS.

Pump\bailer depth: 40.0 feet.

Volume Purged: 15.0 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ____________________

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: **Solutia Performance Monitoring** Date: 06-25-98

Well No: MW-5A Time Sample Taken: 1600

Well Total Depth: 33.0 Casing Head Elevation: 594.65

Depth to Water: 25.14 Elevation of Water Level: 569.51

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 19.3 °C; pH 5.80 ; Sp. Conductance 680 µS.

Intermed: Temperature 19.5 °C; pH 5.80 ; Sp. Conductance 850 µS.

Final: Temperature 19.1 °C; pH 5.70 ; Sp. Conductance 840 µS.

Pump\bailer depth: 32.0 feet.

Volume Purged: 5.5 gallons; Rate of Purge: 0.3 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ______

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: **Solutia Performance Monitoring** Date: 06-25-98

Well No: MW-5B Time Sample Taken: 1645

Well Total Depth: 56.0 Casing Head Elevation: 594.97

Depth to Water: 25.37 Elevation of Water Level: 569.60

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 19.1 °C; pH 5.9 ; Sp. Conductance 1370 µS.

Intermed: Temperature 19.2 °C; pH 6.3 ; Sp. Conductance 1650 µS.

Final: Temperature 20.0 °C; pH 6.2 ; Sp. Conductance 1660 µS.

Pump\bailer depth: 40.0 feet.

Volume Purged: 14 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments:

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 06-26-98

Well No: MW-7 Time Sample Taken: 1410

Well Total Depth: 31.66 Casing Head Elevation: 594.03

Depth to Water: 27.44 Elevation of Water Level: 566.59

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer X or Pump ______

Initial: Temperature 19.6 °C; pH 6.71 ; Sp. Conductance 530 µS.

Intermed: Temperature 20.1 °C; pH 6.60 ; Sp. Conductance 580 µS.

Final: Temperature 19.5 °C; pH 6.74 ; Sp. Conductance 560 µS.

Pump\bailer depth: 31.66 TD feet.

Volume Purged: 1.2 gallons; Rate of Purge: 0.3 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Purged well dry - sampled first recovery. Approximately 6" of product on water column.

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: **Solutia Performance Monitoring** Date: 06-25-98

Well No: MW-14 Time Sample Taken: 1220

Well Total Depth: 30.43 Casing Head Elevation: 593.57

Depth to Water: 15.67 Elevation of Water Level: 577.90

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer______ or Pump X

Initial: Temperature 19.9 °C; pH 6.78 ; Sp. Conductance 280 µS.

Intermed: Temperature 15.9 °C; pH 6.59 ; Sp. Conductance 290 µS.

Final: Temperature 17.2 °C; pH 6.29 ; Sp. Conductance 270 µS.

Pump\bailer depth: 30.0 feet.

Volume Purged: 9.0 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments:

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 06-25-98

Well No: MW-20A Time Sample Taken: 1300

Well Total Depth: 40.0 Casing Head Elevation: 596.09

Depth to Water: 27.03 Elevation of Water Level: 569.06

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 20.2 °C; pH 6.6 ; Sp. Conductance 180 µS.

Intermed: Temperature 19.9 °C; pH 6.3 ; Sp. Conductance 1050 µS.

Final: Temperature 19.0 °C; pH 6.4 ; Sp. Conductance 1030 µS.

Pump\bailer depth: 39.0 feet.

Volume Purged: 4.0 gallons; Rate of Purge: 0.1 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ______

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: **Solutia Performance Monitoring** Date: 06-25-98

Well No: MW-20B Time Sample Taken: 1430

Well Total Depth: 57.0 Casing Head Elevation: 596.76

Depth to Water: 27.10 Elevation of Water Level: 569.66

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 19.7 °C; pH 6.5 ; Sp. Conductance 2120 μS.

Intermed: Temperature 20.5 °C; pH 6.5 ; Sp. Conductance 2850 μS.

Final: Temperature 19.9 °C; pH 6.6 ; Sp. Conductance 2940 μS.

Pump\bailer depth: 40.0 feet.

Volume Purged: 14 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ____

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 06-25-98

Well No: MW-22R Time Sample Taken: 1720

Well Total Depth: 40.0 Casing Head Elevation: 596.76

Depth to Water: 28.61 Elevation of Water Level: 568.15

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 19.9 °C; pH 6.3 ; Sp. Conductance 1690 µS.

Intermed: Temperature 20.0 °C; pH 6.1 ; Sp. Conductance 1730 µS.

Final: Temperature 19.7 °C; pH 6.2 ; Sp. Conductance 1725 µS.

Pump\bailer depth: 39.0 feet.

Volume Purged: 6.0 gallons; Rate of Purge: 0.3 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ____

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: **Solutia Performance Monitoring** Date: 06-25-98

Well No: MW-23A Time Sample Taken: 1500

Well Total Depth: 35.0 Casing Head Elevation: 598.82

Depth to Water: 27.76 Elevation of Water Level: 571.06

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 18.3 °C; pH 8.85 ; Sp. Conductance 1220 µS.

Intermed: Temperature 17.9 °C; pH 8.78 ; Sp. Conductance 1300 µS.

Final: Temperature 17.8 °C; pH 8.93 ; Sp. Conductance 1280 µS.

Pump\bailer depth: 34.0 feet.

Volume Purged: 6.0 gallons; Rate of Purge: 0.2 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ______

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: **Solutia Performance Monitoring** Date: 06-26-98

Well No: MW-24A Time Sample Taken: 1455

Well Total Depth: 35.0 Casing Head Elevation: 594.58

Depth to Water: 25.62 Elevation of Water Level: 568.96

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer X or Pump ____

Initial: Temperature 19.9 °C; pH 7.05 ; Sp. Conductance 1310 μS.

Intermed: Temperature 20.6 °C; pH 7.10 ; Sp. Conductance 970 μS.

Final: Temperature 20.1 °C; pH 7.03 ; Sp. Conductance 950 μS.

Pump\bailer depth: 35.0 TD feet.

Volume Purged: 3.7 gallons; Rate of Purge: 0.3 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Purged well dry - sampled first recovery. Water dark brown to black - sediment high.

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: **Solutia Performance Monitoring** Date: 06-26-98

Well No: TD-5 Time Sample Taken: 0930

Well Total Depth: 30.4 Casing Head Elevation: 589.49

Depth to Water: 22.73 Elevation of Water Level: 566.76

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer________ or Pump X

Initial: Temperature 16.2 °C; pH 6.1 ; Sp. Conductance 1150 µS.

Intermed: Temperature 16.1 °C; pH 6.1 ; Sp. Conductance 1350 µS.

Final: Temperature 16.1 °C; pH 6.0 ; Sp. Conductance 1280 µS.

Pump\bailer depth: 29.0 feet.

Volume Purged: 7.0 gallons; Rate of Purge: 0.4 gal/min.

Sample Protocol: See Chain-of-Custody

Comments:

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: **Solutia Performance Monitoring** Date: 06-26-98

Well No: WT-13A Time Sample Taken: 1215

Well Total Depth: 35.06 Casing Head Elevation: 590.82

Depth to Water: 24.21 Elevation of Water Level: 566.61

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 20.3 °C; pH 6.1 ; Sp. Conductance 620 µS.

Intermed: Temperature 19.9 °C; pH 6.1 ; Sp. Conductance 620 µS.

Final: Temperature 19.8 °C; pH 6.1 ; Sp. Conductance 610 µS.

Pump\bailer depth: 34.0 feet.

Volume Purged: 12 gallons; Rate of Purge: 0.4 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ____

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 06-26-98

Well No: WT-14A Time Sample Taken: 1020

Well Total Depth: 29.29 Casing Head Elevation: 593.57

Depth to Water: 21.70 Elevation of Water Level: 571.87

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 16.9 °C; pH 7.8 ; Sp. Conductance 6960 µS.

Intermed: Temperature 17.2 °C; pH 7.8 ; Sp. Conductance 7990 µS.

Final: Temperature 16.9 °C; pH 7.8 ; Sp. Conductance 8100 µS.

Pump\bailer depth: 28.0 feet.

Volume Purged: 18 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ____

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 06-26-98

Well No: WT-15A Time Sample Taken: 1130

Well Total Depth: 24.87 Casing Head Elevation: 589.08

Depth to Water: 7.79 Elevation of Water Level: 581.29

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 19.3 °C; pH 5.9 ; Sp. Conductance 600 µS.

Intermed: Temperature 19.4 °C; pH 5.8 ; Sp. Conductance 730 µS.

Final: Temperature 19.1 °C; pH 5.8 ; Sp. Conductance 710 µS.

Pump\bailer depth: 23.5 feet.

Volume Purged: 7 gallons; Rate of Purge: 0.2 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ______

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

3RD QUARTER 1998

DRAFT

PROFESSIONAL ENVIRONMENTAL CONSULTING SERVICES PERFORMED FOR:

SOLUTIA, INC.
1 MONSANTO ROAD
NITRO WV 25143

REIC Job #	L65283
Project ID:	97025.002
Custody #:	1518 & 1517
Site ID:	SOLUTIA INC
Date Submitted:	07-OCT-98

SOLUTIA, INC.

Client Sample ID: MW-1A

REIC Sample ID: L65283-1

Client Project ID: 97025.002

Sample Date: 05-OCT-98

Matrix: Liquid

Custody #: 1518

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
trichloroethylene	ND	mg/l	8240B	0.005	08-OCT-98	TC

REIConsultants, Inc.

L65283

SOLUTIA, INC.

Client Sample ID:	MW-1B	**Sample Date:**	05-OCT-98
REIC Sample ID:	L65283-2	**Matrix:**	Liquid
Client Project ID:	97025.002	**Custody #:**	1518

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
trichloroethylene	ND	mg/l	8240B	0.005	08-OCT-98	TC

REIConsultants, Inc.

L65283

SOLUTIA, INC.

Client Sample ID: MW-5A

REIC Sample ID: L65283-3

Client Project ID: 97025.002

Sample Date: 05-OCT-98

Matrix: Liquid

Custody #: 1518

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
trichloroethylene	1.67	mg/l	8240B	0.005	09-OCT-98	TC

SOLUTIA, INC.

Client Sample ID: MW-5B
Sample Date: 05-OCT-98
REIC Sample ID: L65283-4
Matrix: Liquid
Client Project ID: 97025.002
Custody #: 1518

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
trichloroethylene	3.40	mg/l	8240B	0.005	09-OCT-98	TC

REIConsultants, Inc.

L65283

SOLUTIA, INC.

Client Sample ID:	MW-20A	**Sample Date:**	05-OCT-98
REIC Sample ID:	L65283-5	**Matrix:**	Liquid
Client Project ID:	97025.002	**Custody #:**	1518

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
trichloroethylene	7.04	mg/l	8240B	0.005	09-OCT-98	TC

REIConsultants, Inc.

L65283

SOLUTIA, INC.

Client Sample ID: MW-20B

Sample Date: 05-OCT-98

REIC Sample ID: L65283-6

Matrix: Liquid

Client Project ID: 97025.002

Custody #: 1518

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
trichloroethylene	2.81	mg/l	8240B	0.250	09-OCT-98	TC

REIConsultants, Inc.

L65283

SOLUTIA, INC.

Client Sample ID: MW-23A

REIC Sample ID: L65283-7

Client Project ID: 97025.002

Sample Date: 05-OCT-98

Matrix: Liquid

Custody #: 1518

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
trichloroethylene	1.19	mg/l	8240B	0.005	09-OCT-98	TC

REIConsultants, Inc.

L65283

SOLUTIA, INC.

Client Sample ID: MW-22R
Sample Date: 06-OCT-98
REIC Sample ID: L65283-8
Matrix: Liquid
Client Project ID: 97025.002
Custody #: 1518

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
benzene	0.007	mg/l	8240B	0.005	09-OCT-98	TC
trichloroethylene	0.017	mg/l	8240B	0.005	09-OCT-98	TC

REIConsultants, Inc.

L65283

SOLUTIA, INC.

Client Sample ID: MW-24A

REIC Sample ID: L65283-9

Client Project ID: 97025.002

Sample Date: 06-OCT-98

Matrix: Liquid

Custody #: 1518

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
benzene	0.349	mg/l	8240B	0.050	09-OCT-98	TC
trichloroethylene	0.167	mg/l	8240B	0.050	09-OCT-98	TC

REIConsultants, Inc.

L65283

SOLUTIA, INC.

Client Sample ID: MW-7

REIC Sample ID: L65283-10

Client Project ID: 97025.002

Sample Date: 06-OCT-98

Matrix: Liquid

Custody #: 1518

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
benzene	2.77	mg/l	8240B	0.500	09-OCT-98	TC

SOLUTIA, INC.

Client Sample ID: MW-14
REIC Sample ID: L65283-11
Client Project ID: 97025.002

Sample Date: 05-OCT-98
Matrix: Liquid
Custody #: 1518

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
benzene	ND	mg/l	8240B	0.005	13-OCT-98	TC

SOLUTIA, INC.

Client Sample ID: TD-5
Sample Date: 06-OCT-98
REIC Sample ID: L65283-12
Matrix: Liquid
Client Project ID: 97025.002
Custody #: 1517

Parameter	Result	Units	Method	MQL	Analyzed	By
SEMI-VOLATILE ORGANIC COMPOUNDS						
2,4,5-trichlorophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2-chlorophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2-nitrophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
4-nitrophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
m,p-cresol	ND	mg/l	8270B	0.020	16-OCT-98	WP
o-cresol	ND	mg/l	8270B	0.020	16-OCT-98	WP
pentachlorophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
phenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
VOLATILE ORGANIC COMPOUNDS						
benzene	ND	mg/l	8240B	0.005	13-OCT-98	TC

REIConsultants, Inc.

L65283

SOLUTIA, INC.

Client Sample ID: WT-13A
REIC Sample ID: L65283-13
Client Project ID: 97025.002

Sample Date: 06-OCT-98
Matrix: Liquid
Custody #: 1517

Parameter	Result	Units	Method	MQL	Analyzed	By
SEMI-VOLATILE ORGANIC COMPOUNDS						
2,4,5-trichlorophenol	0.113	mg/l	8270B	0.020	16-OCT-98	WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2-chlorophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2-nitrophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
4-nitrophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
m,p-cresol	ND	mg/l	8270B	0.020	16-OCT-98	WP
o-cresol	ND	mg/l	8270B	0.020	16-OCT-98	WP
pentachlorophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
phenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
VOLATILE ORGANIC COMPOUNDS						
benzene	ND	mg/l	8240B	0.005	13-OCT-98	TC

REIConsultants, Inc.

L65283

SOLUTIA, INC.

Client Sample ID: WT-15A **Sample Date:** 06-OCT-98

REIC Sample ID: L65283-14 **Matrix:** Liquid

Client Project ID: 97025.002 **Custody #:** 1517

Parameter	Result	Units	Method	MQL	Analyzed	By
SEMI-VOLATILE ORGANIC COMPOUNDS						
2,4,5-trichlorophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2-chlorophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2-nitrophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
4-nitrophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
m,p-cresol	ND	mg/l	8270B	0.020	16-OCT-98	WP
o-cresol	ND	mg/l	8270B	0.020	16-OCT-98	WP
pentachlorophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
phenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
VOLATILE ORGANIC COMPOUNDS						
benzene	0.006	mg/l	8240B	0.005	13-OCT-98	TC

REIConsultants, Inc.

L65283

SOLUTIA, INC.

Client Sample ID: WT-14A   **Sample Date:** 06-OCT-98

REIC Sample ID: L65283-15   **Matrix:** Liquid

Client Project ID: 97025.002   **Custody #:** 1517

Parameter	Result	Units	Method	MQL	Analyzed	By
GENERAL CHEMISTRY						
Ammonia Nitrogen	120	mg/l	4500-NH3B&E	1.0	09-OCT-98	KM
Nitrate	61.9	mg/l	300	0.10	08-OCT-98	DM
Nitrite	ND	mg/l	300	0.50	08-OCT-98	DM
Orthophosphate	0.35	mg/l	4500-P&E	0.05	08-OCT-98	DM
pH	7.65	SU	4500-H+ B	NA	08-OCT-98	RT
TKN	215	mg/l	351.3	1.0	12-OCT-98	KM
Total Phosphate	0.76	mg/l	4500-P B5 E	0.05	14-OCT-98	DM
SEMI-VOLATILE ORGANIC COMPOUNDS						
2,4,5-trichlorophenol	0.030	mg/l	8270B	0.020	16-OCT-98	WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2,4-dichlorophenol	0.033	mg/l	8270B	0.020	16-OCT-98	WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	16-OCT-98	WI
2,4-dinitrophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2-chlorophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
2-nitrophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
4-nitrophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
m,p-cresol	ND	mg/l	8270B	0.020	16-OCT-98	WP
o-cresol	ND	mg/l	8270B	0.020	16-OCT-98	WP
pentachlorophenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
phenol	ND	mg/l	8270B	0.020	16-OCT-98	WP
VOLATILE ORGANIC COMPOUNDS						
benzene	0.008	mg/l	8240B	0.005	13-OCT-98	TC

REIConsultants, Inc.

L65283

SOLUTIA, INC.

Client Sample ID: TRIP BLANK

REIC Sample ID: L65283-16

Client Project ID: 97025.002

Sample Date: 05-OCT-98

Matrix: Liquid

Custody #: 1517

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
benzene	ND	mg/l	8240B	0.005	13-OCT-98	TC
trichloroethylene	ND	mg/l	8240B	0.005	13-OCT-98	TC

Abbreviations Key

ANA - Analysis Not Available
BTU - British Thermal Units
DRO - Diesel Range Organics
GPM - Gallons Per Minute
GRO - Gasoline Range Organics
KRO - Kerosene Range Organics
MDL - Method Detection Limit
MQL - Minimum Quantifying Level
NA - Not Applicable
ND - None Detected at MQL
NTU - Nephelometric Turbidity Units
ORO - Oil Range Organics
SU - Standard Units
TPH - Total Petroleum Hydrocarbons
TKN - Total Kjeldahl Nitrogen
TS - Total Solids
TSS - Total Suspended Solids
VSS - Volatile Suspended Solids

Date: 10·22·98 Approved: Claud Hunt
Inorganic Department Manager

Date: 10-22-98 Approved: Joseph Robertson
Organic Department Manager

Date: 10-22·98 Approved: Claud Hunt
Vice-President

Appendix A - Quality Control Summary

Method	Surrogate	% Recovery
L65283-1		
8240B	1,2-dichloroethane-d4	101
8240B	4-bromofluorobenzene	112
8240B	toluene-d8	98
L65283-2		
8240B	1,2-dichloroethane-d4	107
8240B	4-bromofluorobenzene	107
8240B	toluene-d8	95
L65283-3		
8240B	1,2-dichloroethane-d4	99
8240B	4-bromofluorobenzene	116
8240B	toluene-d8	95
L65283-4		
8240B	1,2-dichloroethane-d4	100
8240B	4-bromofluorobenzene	112
8240B	toluene-d8	93
L65283-5		
8240B	1,2-dichloroethane-d4	102
8240B	4-bromofluorobenzene	112
8240B	toluene-d8	94
L65283-6		
8240B	1,2-dichloroethane-d4	92
8240B	4-bromofluorobenzene	114
8240B	toluene-d8	95
L65283-7		
8240B	1,2-dichloroethane-d4	106
8240B	4-bromofluorobenzene	110
8240B	toluene-d8	94
L65283-8		
8240B	1,2-dichloroethane-d4	102
8240B	4-bromofluorobenzene	110
8240B	toluene-d8	95
L65283-9		
8240B	1,2-dichloroethane-d4	102
8240B	4-bromofluorobenzene	116
8240B	toluene-d8	97

Appendix A - Quality Control Summary

Method	Surrogate	% Recovery
L65283-10		
8240B	1,2-dichloroethane-d4	101
8240B	4-bromofluorobenzene	104
8240B	toluene-d8	95
L65283-11		
8240B	1,2-dichloroethane-d4	102
8240B	4-bromofluorobenzene	100
8240B	toluene-d8	99
L65283-12		
8240B	1,2-dichloroethane-d4	96
8240B	4-bromofluorobenzene	101
8240B	toluene-d8	100
8270B	2,4,6-tribromophenol	107
8270B	2-fluorophenol	88
8270B	phenol-d6	74
L65283-13		
8240B	1,2-dichloroethane-d4	96
8240B	4-bromofluorobenzene	102
8240B	toluene-d8	99
8270B	2,4,6-tribromophenol	105
8270B	2-fluorophenol	81
8270B	phenol-d6	65
L65283-14		
8240B	1,2-dichloroethane-d4	100
8240B	4-bromofluorobenzene	103
8240B	toluene-d8	99
8270B	2,4,6-tribromophenol	90
8270B	2-fluorophenol	86
8270B	phenol-d6	83
L65283-15		
8240B	1,2-dichloroethane-d4	104
8240B	4-bromofluorobenzene	100
8240B	toluene-d8	100
8270B	2,4,6-tribromophenol	88
8270B	2-fluorophenol	90
8270B	phenol-d6	83

Appendix A - Quality Control Summary

Method	Surrogate	% Recovery
	L65283-16	
8240B	1,2-dichloroethane-d4	100
8240B	4-bromofluorobenzene	100
8240B	toluene-d8	99

Potes   & Associates, Inc.
ENGINEERS AND ENVIRONMENTAL CONSULTANTS
University of Charleston, Cox Hall
2300 MacCorkle Ave. SE, Charleston, WV 25304
Tel: (304) ~~357-4990~~ FAX: (304) ~~357-4988~~

CHAIN OF CUSTODY RECORD
№ 1518
PAGE 1 OF 2

CLIENT/SAMPLING SITE: Solutia, Inc.
ADDRESS: 1 Monsanto Rd.
CITY/STATE/ZIP: Nitro, WV 25143
PROJECT NO.: 97025.002 DATE: 10-6-98

CONTACT PERSON: D. Junker - Potesta + Assoc.
TELEPHONE/FAX: 342-1400 / 343-9031
SAMPLER: D. Junker
HOW SHIPPED: REIC Courier

SAMPLE LOG AND ANALYSIS REQUESTED

TURNAROUND TIME
X REGULAR
RUSH

PRESERVATIVES
0 NO PRESERVATIVE
1 HYDROCHLORIC ACID
2 NITRIC ACID
3 SULFURIC ACID
4 SODIUM THIOSULFATE
5 SODIUM HYDROXIDE
6 ZINC ACETATE
7 EDTA

ANALYSIS REQUESTED & METHOD / PRESERVATIVE CODES: TCE (1), Benzene (1), Phenols (0), (0)

SAMPLE ID	NO. & TYPE OF CONTAINERS	DATE/TIME	MATRIX	SAMPLE COMP/GRAB	TCE	Benzene	Phenols									REMARKS
MW-1A	2-40ml	10-5-98 1050	GW	Grab	X											Benzene MQL 0.005
MW-1B	"	10-5-98 1055	"	"	X											TCE MQL 0.005
MW-5A	"	10-5-98 1700	"	"	X											
MW-5B	"	10-5-98 1720	"	"	X											
MW-20A	"	10-5-98 1600	"	"	X											
MW-20B	"	10-5-98 1550	"	"	X											
MW-23A	"	10-5-98 1245	"	"	X											
MW-22R	"	10-6-98 1015	"	"	X	X										
MW-24A	"	10-6-98 1500	"	"	X	X										
MW-7	~~10-6-98 1450~~	10-6-98 1450	"	"		X										
MW-14	"	10-5-98 1500	"	"		X										

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
David N. Junker	10-7-98 11:15 Am	[signature]	[signature]	10/7/98 3:15	

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	CONDITION ON ARRIVAL:

COMMENTS Analysis by REIC Laboratory - Billing to Tony Tuck of Solutia Inc.
Copy of results to D. Junker of Potesta + Associates Fax 343-9031

Potesta & Associates, Inc.
ENGINEERS AND ENVIRONMENTAL CONSULTANTS
University of Charleston, Cox Hall
2300 MacCorkle Ave. SE, Charleston, WV 25304
Tel: (304) 357-4990 FAX: (304) 357-4988

CHAIN OF CUSTODY RECORD
№ 1517
PAGE 2 OF 2

CLIENT/SAMPLING SITE: Solutia, Inc
ADDRESS: 1 Monsanto Rd.
CITY/STATE/ZIP: Nitro, WV 25143
PROJECT NO.: 97025.002 DATE: 10-6-98

CONTACT PERSON: D. Junker - Potesta + Assoc.
TELEPHONE/FAX: 342-1400 / 343-9031
SAMPLER: D. Junker
HOW SHIPPED: REIC Courier

SAMPLE LOG AND ANALYSIS REQUESTED

TURNAROUND TIME: X REGULAR ___ RUSH

PRESERVATIVES
0 NO PRESERVATIVE
1 HYDROCHLORIC ACID
2 NITRIC ACID
3 SULFURIC ACID
4 SODIUM THIOSULFATE
5 SODIUM HYDROXIDE
6 ZINC ACETATE
7 EDTA

ANALYSIS REQUESTED & METHOD / PRESERVATIVE CODES

SAMPLE ID	NO. & TYPE OF CONTAINERS	DATE/TIME	MATRIX	SAMPLE COMP/GRAB	TCE (1)	Benzene (1)	Phenols (0)	Semi-Vols (0)	Nutrient Anly (0)							REMARKS
TD-5	1-G. Liter 2-40ml	10-6-98 0845	GW	Grab		X	X	X								MQL 0.02
WT-13A	"	10-6-98 1135	"	"		X	X	X								
WT-15A	"	10-6-98 1230	"	"		X	X	X								
WT-14A	1-G. Liter 2-40ml 2-Plas Liter	10-6-98 1430	"	"		X	X	X	X							

REMARKS: Include: o-cresol, m,p-cresol; Nutrient Analysis: Ammonia, ~~Ammonia~~ ortho-phosp[illegible], TKN, pH, Nitrates [illegible], nitrites, Tot phosph[illegible]

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
David N. Junker	10-7-98 11:15 Am	[signature]	[signature]	10/7/98 3:15	
RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	CONDITION ON ARRIVAL:	

COMMENTS: Analysis by REIC Laboratory - Billing to Tony Tuk of Solutia, Inc.
[Co]py of results to D. Junker - Po[tes]ta + Assoc. Fax 343-9031

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 10-5-98

Well No: MW-1A Time Sample Taken: 1050

Well Total Depth: 32' Casing Head Elevation: 594.37

Depth to Water: 19.28 Elevation of Water Level: 575.09

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 18.3 °C; pH 8.29 ; Sp. Conductance 760 µS.

Intermed: Temperature 18.6 °C; pH 9.26 ; Sp. Conductance 470 µS.

Final: Temperature 18.4 °C; pH 9.18 ; Sp. Conductance 485 µS.

Pump\bailer depth: 31.0 feet.

Volume Purged: 10.0 gallons; Rate of Purge: 0.4 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ______

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 10-5-98

Well No: MW-1B Time Sample Taken: 1055

Well Total Depth: 55' Casing Head Elevation: 594.38

Depth to Water: 19.39 Elevation of Water Level: 574.99

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 17.8 °C; pH 8.32 ; Sp. Conductance 790 µS.

Intermed: Temperature 17.6 °C; pH 8.15 ; Sp. Conductance 760 µS.

Final: Temperature 17.5 °C; pH 8.07 ; Sp. Conductance 740 µS.

Pump\bailer depth: 45 feet.

Volume Purged: 15.0 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ______

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 10-5-98

Well No: MW-5A Time Sample Taken: 1700

Well Total Depth: 33.0 Casing Head Elevation: 594.65

Depth to Water: 25.65 Elevation of Water Level: 569.00

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 22.6 °C; pH 9.31 ; Sp. Conductance 1130 µS.

Intermed: Temperature 21.5 °C; pH 7.62 ; Sp. Conductance 1220 µS.

Final: Temperature 21.7 °C; pH 7.41 ; Sp. Conductance 1210 µS.

Pump\bailer depth: 32.0 feet.

Volume Purged: 8.0 gallons; Rate of Purge: 0.3 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ______

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 10-5-98

Well No: MW-5B Time Sample Taken: 1720

Well Total Depth: 56.0 Casing Head Elevation: 594.97

Depth to Water: 25.87 Elevation of Water Level: 569.10

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ________ or Pump X

Initial: Temperature 19.5 °C; pH 8.54 ; Sp. Conductance 2260 µS.

Intermed: Temperature 19.6 °C; pH 8.04 ; Sp. Conductance 3000 µS.

Final: Temperature 19.4 °C; pH 8.01 ; Sp. Conductance 2920 µS.

Pump\bailer depth: 45.0 feet.

Volume Purged: 13.0 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ______________________________

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 10-6-98

Well No: MW-7 Time Sample Taken: 1450

Well Total Depth: 31.66 Casing Head Elevation: 594.03

Depth to Water: 27.99 Elevation of Water Level: 566.04

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer X or Pump ____

Initial: Temperature 20.4 °C; pH 6.86 ; Sp. Conductance 600 µS.

Intermed: Temperature ____ °C; pH ____ ; Sp. Conductance ____ µS.

Final: Temperature 20.0 °C; pH 6.43 ; Sp. Conductance 595 µS.

Pump\bailer depth: 31.66 feet.

Volume Purged: 3.1 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ____

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 10-5-98

Well No: MW-14 Time Sample Taken: 1500

Well Total Depth: 30.43 Casing Head Elevation: 593.57

Depth to Water: 16.29 Elevation of Water Level: 577.28

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer______ or Pump X

Initial: Temperature 17.2 °C; pH 8.49 ; Sp. Conductance 350 μS.

Intermed: Temperature 16.6 °C; pH 8.01 ; Sp. Conductance 390 μS.

Final: Temperature 16.4 °C; pH 7.74 ; Sp. Conductance 405 μS.

Pump\bailer depth: 30.0 feet.

Volume Purged: 9.0 gallons; Rate of Purge: 0.4 gal/min.

Sample Protocol: See Chain-of-Custody

Comments:

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 10-5-98

Well No: MW-20A Time Sample Taken: 1600

Well Total Depth: 40.0 Casing Head Elevation: 596.09

Depth to Water: 27.56 Elevation of Water Level: 568.53

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 21.3 °C; pH 7.97 ; Sp. Conductance 1690 µS.

Intermed: Temperature 19.3 °C; pH 7.90 ; Sp. Conductance 1680 µS.

Final: Temperature 20.1 °C; pH 8.04 ; Sp. Conductance 1680 µS.

Pump\bailer depth: 39.0 feet.

Volume Purged: 4.5 gallons; Rate of Purge: 0.2 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ______

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 10-5-98

Well No: MW-20B Time Sample Taken: 1550

Well Total Depth: 57.0 Casing Head Elevation: 596.76

Depth to Water: 27.63 Elevation of Water Level: 569.13

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer______ or Pump X

Initial: Temperature 19.9 °C; pH 8.48 ; Sp. Conductance 2870 µS.

Intermed: Temperature 19.7 °C; pH 8.54 ; Sp. Conductance 5070 µS.

Final: Temperature 19.7 °C; pH 8.48 ; Sp. Conductance 5090 µS.

Pump\bailer depth: 45.0 feet.

Volume Purged: 13.5 gallons; Rate of Purge: 0.4 gal/min.

Sample Protocol: See Chain-of-Custody

Comments:

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 10-6-98

Well No: MW-22R Time Sample Taken: 1015

Well Total Depth: 40.0 Casing Head Elevation: 596.76

Depth to Water: 27.55 Elevation of Water Level: 569.21

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 18.7 °C; pH 4.66 ; Sp. Conductance 2070 µS.

Intermed: Temperature 18.4 °C; pH 6.71 ; Sp. Conductance 2070 µS.

Final: Temperature 18.3 °C; pH 6.83 ; Sp. Conductance 2130 µS.

Pump\bailer depth: __________ feet.

Volume Purged: ______ gallons; Rate of Purge: ______ gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ______

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 10-5-98

Well No: MW-23A Time Sample Taken: 1245

Well Total Depth: 35.0 Casing Head Elevation: 598.82

Depth to Water: 28.82 Elevation of Water Level: 570.00

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 18.3 °C; pH 8.93 ; Sp. Conductance 1780 μS.

Intermed: Temperature 18.1 °C; pH 7.99 ; Sp. Conductance 1980 μS.

Final: Temperature 18.1 °C; pH 8.93 ; Sp. Conductance 1960 μS.

Pump\bailer depth: 34 feet.

Volume Purged: 6.0 gallons; Rate of Purge: 0.3 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ____

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: **Solutia Performance Monitoring** Date: 10-6-98

Well No: MW-24A Time Sample Taken: 1500

Well Total Depth: 35.0 Casing Head Elevation: 594.58

Depth to Water: 26.22 Elevation of Water Level: 568.36

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer X or Pump ____

Initial: Temperature 19.9 °C; pH 7.36 ; Sp. Conductance 1410 µS.

Intermed: Temperature 18.9 °C; pH 7.45 ; Sp. Conductance 1500 µS.

Final: Temperature ____ °C; pH ____ ; Sp. Conductance ____ µS.

Pump\bailer depth: 35.0 feet.

Volume Purged: 8.5 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Purged well dry - sampled first recovery. After six hour wait for well to clear.

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 10-6-98

Well No: TD-5 Time Sample Taken: 0845

Well Total Depth: 30.4 Casing Head Elevation: 589.49

Depth to Water: 23.15 Elevation of Water Level: 566.34

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 16.5 °C; pH 7.37 ; Sp. Conductance 1700 µS.

Intermed: Temperature 17.7 °C; pH 7.08 ; Sp. Conductance 1870 µS.

Final: Temperature 16.3 °C; pH 6.95 ; Sp. Conductance 1780 µS.

Pump\bailer depth: 29.5 feet.

Volume Purged: 8.3 gallons; Rate of Purge: 0.2 gal/min.

Sample Protocol: See Chain-of-Custody

Comments:

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Solutia Performance Monitoring Date: 10-6-98

Well No: WT-13A Time Sample Taken: 1135

Well Total Depth: 35.06 Casing Head Elevation: 590.82

Depth to Water: 24.59 Elevation of Water Level: 566.23

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ________ or Pump X

Initial: Temperature 18.1 °C; pH 8.65 ; Sp. Conductance 650 µS.

Intermed: Temperature 17.4 °C; pH 7.80 ; Sp. Conductance 710 µS.

Final: Temperature 16.8 °C; pH 7.84 ; Sp. Conductance 760 µS.

Pump\bailer depth: 34.0 feet.

Volume Purged: 14 gallons; Rate of Purge: 0.3 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ________

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: **Solutia Performance Monitoring** Date: 10-6-98

Well No: WT-14A Time Sample Taken: 1430

Well Total Depth: 29.29 Casing Head Elevation: 593.57

Depth to Water: 2636 Elevation of Water Level: 567.21

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer ________ or Pump X

Initial: Temperature 20.1 °C; pH 11.19 ; Sp. Conductance 9470 μS.

Intermed: Temperature 20.2 °C; pH 7.86 ; Sp. Conductance 9600 μS.

Final: Temperature 20.1 °C; pH 7.9 ; Sp. Conductance 9580 μS.

Pump\bailer depth: 28.5 feet.

Volume Purged: 4.8 gallons; Rate of Purge: 0.1 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ________________________________

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: **Solutia Performance Monitoring** Date: 10-6-98

Well No: WT-15A Time Sample Taken: 1230

Well Total Depth: 24.87 Casing Head Elevation: 589.08

Depth to Water: 10.29 Elevation of Water Level: 578.79

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Tubing Volume Factor: N/A x (Well T.D.-SWL N/A) x 3 =

Purge Volume N/A Gallons.
See below for tubing volume factors.

Type of Purge: Bailer______ or Pump X

Initial: Temperature 18.1 °C; pH 8.97 ; Sp. Conductance 670 µS.

Intermed: Temperature 18.5 °C; pH 8.00 ; Sp. Conductance 670 µS.

Final: Temperature 18.6 °C; pH 7.83 ; Sp. Conductance 660 µS.

Pump\bailer depth: 24.0 feet.

Volume Purged: 12.0 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments:

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

4TH QUARTER 1998

DRAFT

REIConsultants, Inc.

PROFESSIONAL ENVIRONMENTAL CONSULTING SERVICES PERFORMED FOR:

SOLUTIA, INC.
1 MONSANTO ROAD
NITRO WV 25143

REIC Job #	L67213
Project ID:	97025.002
Custody #:	63088/63089
Site ID:	SOLUTIA PERFORMANCE MONIT.
Date Submitted:	09-DEC-98

REIConsultants, Inc.

L67213

SOLUTIA, INC.

Client Sample ID: MW-1A

Sample Date: 03-DEC-98

REIC Sample ID: L67213-1

Matrix: Liquid

Client Project ID: 97025.002

Custody #: 63088/63089

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
trichloroethylene	ND	mg/l	8240B	0.005	11-DEC-98	TC

REIConsultants, Inc.

L67213

SOLUTIA, INC.

Client Sample ID: MW-1B
REIC Sample ID: L67213-2
Client Project ID: 97025.002

Sample Date: 03-DEC-98
Matrix: Liquid
Custody #: 63089

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
trichloroethylene	ND	mg/l	8240B	0.005	11-DEC-98	TC

REIConsultants, Inc.

L67213

SOLUTIA, INC.

Client Sample ID: MW-5A
REIC Sample ID: L67213-3
Client Project ID: 97025.002

Sample Date: 03-DEC-98
Matrix: Liquid
Custody #: 63089

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
trichloroethylene	1.16	mg/l	8240B	0.005	12-DEC-98	TC

REIConsultants, Inc.

L67213

SOLUTIA, INC.

Client Sample ID: MW-5B

REIC Sample ID: L67213-4

Client Project ID: 97025.002

Sample Date: 03-DEC-98

Matrix: Liquid

Custody #: 63089

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
trichloroethylene	3.43	mg/l	8240S	0.005	14-DEC-98	TC

REIConsultants, Inc.

L67213

SOLUTIA, INC.

Client Sample ID: MW-20A

Sample Date: 03-DEC-98

REIC Sample ID: L67213-5

Matrix: Liquid

Client Project ID: 97025.002

Custody #: 63089

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
trichloroethylene	7.41	mg/l	8240B	0.250	14-DEC-98	TC

REIConsultants, Inc.

L67213

SOLUTIA, INC.

Client Sample ID: MW-20B

REIC Sample ID: L67213-8

Client Project ID: 97025.002

Sample Date: 03-DEC-98

Matrix: Liquid

Custody #: 63089

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
trichloroethylene	2.79	mg/l	8240B	0.250	11-DEC-98	TC

SOLUTIA, INC.

Client Sample ID: MW-22R

REIC Sample ID: L67213-7

Client Project ID: 97025.002

Sample Date: 09-DEC-98

Matrix: Liquid

Custody #: 63089

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
benzene	ND	mg/l	8240B	0.005	14-DEC-98	TC
trichloroethylene	ND	mg/l	8240B	0.005	14-DEC-98	TC

REIConsultants, Inc.

L67213

SOLUTIA, INC.

Client Sample ID: MW-23A

REIC Sample ID: L67213-8

Client Project ID: 97025.002

Sample Date: 03-DEC-98

Matrix: Liquid

Custody #: 63089

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
trichloroethylene	1.67	mg/l	8240B	0.005	15-DEC-98	TC

SOLUTIA, INC.

Client Sample ID: MW-24A

Sample Date: 09-DEC-98

REIC Sample ID: L67213-9

Matrix: Liquid

Client Project ID: 97025.002

Custody #: 63089

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
benzene	0.618	mg/l	8240B	0.025	16-DEC-98	TC
trichloroethylene	0.200	mg/l	8240B	0.025	16-DEC-98	TC

REIConsultants, Inc.

L67213

SOLUTIA, INC.

Client Sample ID: MW-7

REIC Sample ID: L67213-10

Client Project ID: 97025.002

Sample Date: 09-DEC-98

Matrix: Liquid

Custody #: 63089

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
benzene	2.99	mg/l	8240B	1.25	15-DEC-98	TC

REIConsultants, Inc.

L67213

SOLUTIA, INC.

Client Sample ID:	MW-14	Sample Date:	03-DEC-98
REIC Sample ID:	L67213-11	Matrix:	Liquid
Client Project ID:	97025.002	Custody #:	63088

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
benzene	ND	mg/l	8240B	0.005	15-DEC-98	TC

REIConsultants, Inc.

L67213

SOLUTIA, INC.

Client Sample ID: TD-5 — Sample Date: 08-DEC-98

REIC Sample ID: L67213-12 — Matrix: Liquid

Client Project ID: 97025.002 — Custody #: 63088

Parameter	Result	Units	Method	MQL	Analyzed	By
SEMIVOLATILE ORGANIC COMPOUNDS						
2,4,5-trichlorophenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
2-chlorophenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
2-nitrophenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
4-nitrophenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
m,p-cresol	ND	mg/l	8270B	0.040	23-DEC-98	WP
o-cresol	ND	mg/l	8270B	0.020	23-DEC-98	WP
pentachlorophenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
phenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
VOLATILE ORGANIC COMPOUNDS						
benzene	ND	mg/l	8240B	0.005	16-DEC-98	TC

REIConsultants, Inc.

L67213

SOLUTIA, INC.

Client Sample ID: WT-13A

Sample Date: 08-DEC-98

REIC Sample ID: L67213-13

Matrix: Liquid

Client Project ID: 97025.002

Custody #: 63088

Parameter	Result	Units	Method	MQL	Analyzed	By
SEMIVOLATILE ORGANIC COMPOUNDS						
2,4,5-trichlorophenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
2-chlorophenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
2-nitrophenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
4-nitrophenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
m,p-cresol	ND	mg/l	8270B	0.040	23-DEC-98	WP
o-cresol	ND	mg/l	8270B	0.020	23-DEC-98	WP
pentachlorophenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
phenol	ND	mg/l	8270B	0.020	23-DEC-98	WP
VOLATILE ORGANIC COMPOUNDS						
benzene	ND	mg/l	8240B	0.005	14-DEC-98	TC

REIConsultants, Inc.

L67213

SOLUTIA, INC.

Client Sample ID: WT-15A | Sample Date: 08-DEC-98
REIC Sample ID: L67213-14 | Matrix: Liquid
Client Project ID: 97025.002 | Custody #: 63088

Parameter	Result	Units	Method	MQL	Analyzed	By
SEMIVOLATILE ORGANIC COMPOUNDS						
2,4,5-trichlorophenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
2-chlorophenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
2-nitrophenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
4-nitrophenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
m,p-cresol	ND	mg/l	8270B	0.040	24-DEC-98	WP
o-cresol	ND	mg/l	8270B	0.020	24-DEC-98	WP
pentachlorophenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
phenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
VOLATILE ORGANIC COMPOUNDS						
benzene	0.007	mg/l	8240B	0.005	15-DEC-98	TC

REIConsultants, Inc.

L67213

SOLUTIA, INC.

Client Sample ID: WT-14A
Sample Date: 08-DEC-98
REIC Sample ID: L67213-15
Matrix: Liquid
Client Project ID: 97025.002
Custody #: 63088

Parameter	Result	Units	Method	MQL	Analyzed	By
GENERAL CHEMISTRY						
Nitrate-Nitrite	25.2	mg/l	300	0.10	15-DEC-98	DM
Orthophosphate	0.57	mg/l	4500-P & E	0.05	10-DEC-98	DM
pH	7.51	SU	4500-H+ B	NA	10-DEC-98	RT
TKN	40.6	mg/l	351.3	1.0	14-DEC-98	KM
Total Phosphate	0.68	mg/l	4500-P B5 E	0.05	15-DEC-98	DM
SEMIVOLATILE ORGANIC COMPOUNDS						
2,4,5-trichlorophenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
2-chlorophenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
2-nitrophenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
4-nitrophenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
m,p-cresol	ND	mg/l	8270B	0.040	24-DEC-98	WP
o-cresol	ND	mg/l	8270B	0.020	24-DEC-98	WP
pentachlorophenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
phenol	ND	mg/l	8270B	0.020	24-DEC-98	WP
VOLATILE ORGANIC COMPOUNDS						
benzene	0.007	mg/l	8240B	0.005	15-DEC-98	TC

REIConsultants, Inc.

L67213

SOLUTIA, INC.

Client Sample ID: TRIP BLANK

REIC Sample ID: L67213-16

Client Project ID: 97025.002

Sample Date: 03-DEC-98

Matrix: Liquid

Custody #: 63088

Parameter	Result	Units	Method	MQL	Analyzed	By
VOLATILE ORGANIC COMPOUNDS						
benzene	ND	mg/l	8240B	0.005	15-DEC-98	TC
trichloroethylene	ND	mg/l	8240B	0.005	15-DEC-98	TC

Abbreviations Key

ANA - Analysis Not Available
BTU - British Thermal Units
DRO - Diesel Range Organics
GPM - Gallons Per Minute
GRO - Gasoline Range Organics
KRO - Kerosene Range Organics
MDL - Method Detection Limit
MQL - Minimum Quantifying Level
NA - Not Applicable
ND - None Detected at MQL
NTU - Nephelometric Turbidity Units
ORO - Oil Range Organics
SU - Standard Units
TPH - Total Petroleum Hydrocarbons
TKN - Total Kjeldahl Nitrogen
TS - Total Solids
TSS - Total Suspended Solids
VSS - Volatile Suspended Solids

Date: 1-5-99 Approved: Ivan W Leef
Inorganic Department Manager

Date: 1-5-99 Approved: Janet M Satterfield
Organic Department Manager

Date: 1-5-99 Approved: [signature]
Vice-President

Appendix A - Quality Control Summary

Method	Surrogate	% Recovery

L67213-1

624	1,2-dichloroethane-d4	101
624	4-bromofluorobenzene	98
624	toluene-d8	103

L67213-2

624	1,2-dichloroethane-d4	102
624	4-bromofluorobenzene	98
624	toluene-d8	102

L67213-3

624	1,2-dichloroethane-d4	106
624	4-bromofluorobenzene	100
624	toluene-d8	98

L67213-4

624	1,2-dichloroethane-d4	102
624	4-bromofluorobenzene	105
624	toluene-d8	101

L67213-5

624	1,2-dichloroethane-d4	103
624	4-bromofluorobenzene	102
624	toluene-d8	102

L67213-6

624	1,2-dichloroethane-d4	102
624	4-bromofluorobenzene	102
624	toluene-d8	100

L67213-7

624	1,2-dichloroethane-d4	105
624	4-bromofluorobenzene	102
624	toluene-d8	101

L67213-8

624	1,2-dichloroethane-d4	103
624	4-bromofluorobenzene	100
624	toluene-d8	103

L67213-9

624	1,2-dichloroethane-d4	103
624	4-bromofluorobenzene	100
624	toluene-d8	103

Appendix A - Quality Control Summary

Method	Surrogate	% Recovery
	L67213-10	
624	1,2-dichloroethane-d4	103
624	4-bromofluorobenzene	95
624	toluene-d8	100
	L67213-11	
624	1,2-dichloroethane-d4	103
624	4-bromofluorobenzene	101
624	toluene-d8	101
	L67213-12	
624	1,2-dichloroethane-d4	94
624	4-bromofluorobenzene	104
624	toluene-d8	102
8270B	2,4,6-tribromophenol	74
8270B	2-fluorophenol	27
8270B	phenol-d6	47
	L67213-13	
624	1,2-dichloroethane-d4	104
624	4-bromofluorobenzene	103
624	toluene-d8	100
8270B	2,4,6-tribromophenol	55
8270B	2-fluorophenol	22
8270B	phenol-d6	31
	L67213-14	
624	1,2-dichloroethane-d4	101
624	4-bromofluorobenzene	104
624	toluene-d8	103
8270B	2,4,6-tribromophenol	87
8270B	2-fluorophenol	29
8270B	phenol-d6	52
	L67213-15	
624	1,2-dichloroethane-d4	104
624	4-bromofluorobenzene	101
624	toluene-d8	102
8270B	2,4,6-tribromophenol	79
8270B	2-fluorophenol	32
8270B	phenol-d6	58

Appendix A - Quality Control Summary

Method	Surrogate	% Recovery
	L67213-16	
624	1,2-dichloroethane-d4	103
624	4-bromofluorobenzene	97
624	toluene-d8	100

REIC

Page 1 of 2

CHAIN OF CUSTODY RECORD NO. 6089

I Consultants, Inc.
225 Industrial Park Rd.
P.O. Box 286, Beaver, WV 25813
Phone: 304-255-2500 or 800-999-0105
FAX: 304-255-2572

CLIENT: Solutia, Inc.
ADDRESS: 1 Monsanto Rd
CITY/STATE/ZIP: Nitro, WV 25143
BILL TO: Tony Tink - Solutia Inc
CITY/STATE/ZIP:

CONTACT PERSON: D. Junker-Raleigh
TELEPHONE/FAX: 346-1100/343-4031
SITE ID & STATE: Solutia Performance Monit.
PROJECT ID: 97035.002
SAMPLER: D.W.J.

SAMPLE LOG AND ANALYSIS REQUEST

TURNAROUND TIME REQUIREMENTS
REGULAR: X
*RUSH: __ 5-Day, __ 3-Day, __ 2-Day, __ 1-Day
*Rush work needs prior Laboratory approval and will include surcharges

PRESERVATIVES
0 No Preservative
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide
6 Zinc Acetate
7 EDTA

PRESERVATIVE CODES — NOTE PRESERVATIVES → 1, 1, 0

ANALYSIS REQUESTED & METHOD: TCE; Benzene; Phenols

SAMPLE ID	NO. & TYPE OF CONTAINERS	SAMPLING DATE / TIME	MATRIX	SAMPLE COMP / GRAB	TCE	Benzene	Phenols	COMMENTS
MW-1A	2-40ml	12-3-98 1130	Liq	Grab	X			TCE MQL 0.005 mg/l
MW-1B	"	12-3-98 1135	"	"	X			Benzene MQL 0.005 mg/l
MW-5A	"	12-3-98 1700	"	"	X			
MW-5B	"	12-3-98 1710	"	"	X			
MW-20A	"	12-3-98 1600	"	"	X			
MW-20B	"	12-3-98 1610	"	"	X			
MW-22R	"	12-4-98 0935	"	"	X	X		
MW-23A	"	12-3-98 1420	"	"	X			
MW-24A	"	12-4-98 1100	"	"	X	X		
MW-7	"	12-4-98 1017	"	"		X		

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
		[signature]	12:50 12/7	[signature]	1500 12/7	[signature]	12-9-98 2200

Special Requests:
Sample Condition: Good? Y N
Temperature Upon Arrival: 3 °C ICE
Shipment: Hand-Del: Courier: UPS: FedEx:
Shipment Date: FAX Results: Y N

REI

Consultants, Inc.
225 Industrial Park Rd.
P.O. Box 286, Beaver, WV 25813
Phone: 304-255-2500 or 800-999-0105
FAX: 304-255-2572

Page 2 of 2

CHAIN OF CUSTODY RECORD NO.

CLIENT: Solutia Inc.
ADDRESS: 1 Monsanto Rd
CITY/STATE/ZIP: Nitro, WV 25143
BILL TO: Terry Tuck - Solutia, Inc.
CITY/STATE/ZIP:

CONTACT PERSON: D. Junker - Potesta
TELEPHONE/FAX: 304-1400 / 343-9031
SITE ID & STATE: Solutia Performance Plant
PROJECT ID: 97025.002
SAMPLER: DNJ

SAMPLE LOG AND ANALYSIS REQUEST

TURNAROUND TIME REQUIREMENTS
REGULAR: X
*RUSH: 5-Day / 3-Day / 2-Day / 1-Day
*Rush work needs prior Laboratory approval and will include surcharges

PRESERVATIVES
0 No Preservative
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide
6 Zinc Acetate
7 EDTA

PRESERVATIVE CODES — NOTE PRESERVATIVES: 1, 1, , 1, 0

ANALYSIS REQUESTED & METHOD: TCE, Benzene, Phenols, Semi Vols, Nutrient Analysis

Note: Copy of results to D. Junker at Potesta Fax 343-9031

SAMPLE ID	NO. & TYPE OF CONTAINERS	SAMPLING DATE / TIME	MATRIX	SAMPLE COMP / GRAB	TCE	Benzene	Phenols	Semi Vols	Nutrient Analysis	COMMENTS
W-14	2-40 ml	12-3-93 1230	Liq	Grab	X					
D-5	2 vials 1 liter	12-8-93 1900	"	"	X	X	X			MRL 0.02
WT-13A	"	12-8-93 1730	"	"	X	X	X			"
WT-15A	"	12-8-93 1640	"	"	X	X	X			"
WT-14A	2 vials 3 1000 ml	12-8-93 1800	"	"	X	X	X	X		"
Trip Blank	2 vials									Include: o-cresol and
										m, p-cresol Phenols.
										Nutrients: ortho-Phosphate
										TKN, pH, Nitrates + Nitrites
										Total phosphate

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
[signature]	12-9-93 1215	[signature]	12:50	[signature]	1500	[signature]	1539 12/9

Special Requests: Billing to Terry Tuck of Solutia, Inc.

Sample Condition: Good? Y N

Temperature Upon Arrival: 3.8 °C ICED

Shipment: Hand Del: Courier: UPS: FedEx:

Shipment Date:

FAX Results: Y N

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-3-98

Well No: MW-1B Time Sample Taken: 1135

Well Total Depth: 55' Casing Head Elevation: 594.38

Depth to Water: 19.84 Elevation of Water Level: 574.54

Tubing Size: 2"

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 16.4 °C; pH 5.61 ; Sp. Conductance 638 µS.

Intermed: Temperature 16.5 °C; pH 5.40 ; Sp. Conductance 605 µS.

Final: Temperature 16.7 °C; pH 5.40 ; Sp. Conductance 645 µS.

Pump\bailer depth: 40.0 feet.

Volume Purged: 12.0 gallons; Rate of Purge: 0.3 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ______

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-3-98

Well No: MW-1A Time Sample Taken: 1130

Well Total Depth: 32' Casing Head Elevation: 594.37

Depth to Water: 19.81 Elevation of Water Level: 574.56

Tubing Size: 2"

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 17.5 °C; pH 5.69 ; Sp. Conductance 279.1 µS.

Intermed: Temperature 18.0 °C; pH 5.82 ; Sp. Conductance 542 µS.

Final: Temperature 18.0 °C; pH 5.79 ; Sp. Conductance 571 µS.

Pump\bailer depth: 31.0 feet.

Volume Purged: 7.5 gallons; Rate of Purge: 0.2 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ______

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-3-98

Well No: MW-5A Time Sample Taken: 1700

Well Total Depth: 33.0 Casing Head Elevation: 594.65

Depth to Water: 25.74 Elevation of Water Level: 568.91

Tubing Size: 2"

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 19.7 °C; pH 5.99 ; Sp. Conductance 177 µS.

Intermed: Temperature 20.1 °C; pH 5.93 ; Sp. Conductance 865 µS.

Final: Temperature 20.3 °C; pH 5.91 ; Sp. Conductance 761 µS.

Pump\bailer depth: 32.0 feet.

Volume Purged: 15 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ____

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-3-98

Well No: MW-5B Time Sample Taken: 1710

Well Total Depth: 56.0 Casing Head Elevation: 594.97

Depth to Water: 25.88 Elevation of Water Level: 569.09

Tubing Size: 2"

Type of Purge: Bailer ________ or Pump X

Initial: Temperature 18.7 °C; pH 6.02 ; Sp. Conductance 1479 µS.

Intermed: Temperature 18.5 °C; pH 6.19 ; Sp. Conductance 2005 µS.

Final: Temperature 18.6 °C; pH 6.24 ; Sp. Conductance 2093 µS.

Pump\bailer depth: ___________ feet.

Volume Purged: ________ gallons; Rate of Purge: _______ gal/min.

Sample Protocol: See Chain-of-Custody

Comments:

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-9-98

Well No: MW-7 Time Sample Taken: 1017

Well Total Depth: 31.66 Casing Head Elevation: 594.03

Depth to Water: 26.91 Elevation of Water Level: 567.12

Tubing Size: 2"

Type of Purge: Bailer X or Pump ______

Initial: Temperature 14.7 °C; pH 6.21 ; Sp. Conductance 835 µS.

Intermed: Temperature ______ °C; pH ______; Sp. Conductance ______ µS.

Final: Temperature ______ °C; pH ______; Sp. Conductance ______ µS.

Pump\bailer depth: 31.6 feet.

Volume Purged: 2.0 gallons; Rate of Purge: 0.1 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Well purged dry - sampled first recovery.

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

26.84 K-level

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-3-98

Well No: MW-14 Time Sample Taken: 1230

Well Total Depth: 30.4 Casing Head Elevation: 593.57

Depth to Water: 16.63 Elevation of Water Level: 576.94

Tubing Size: 2"

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 16.2 °C; pH 5.32 ; Sp. Conductance 146.0 µS.

Intermed: Temperature 16.8 °C; pH 5.44 ; Sp. Conductance 260.6 µS.

Final: Temperature 16.5 °C; pH 5.35 ; Sp. Conductance 249.0 µS.

Pump\bailer depth: 39.0 feet.

Volume Purged: 9.5 gallons; Rate of Purge: 0.2 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ____

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-3-98

Well No: MW-20A Time Sample Taken: 1600

Well Total Depth: 40.0 Casing Head Elevation: 596.09

Depth to Water: 27.58 Elevation of Water Level: 568.51

Tubing Size: 2"

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 18.0 °C; pH 6.10 ; Sp. Conductance 1149 µS.

Intermed: Temperature 17.8 °C; pH 6.00 ; Sp. Conductance 1131 µS.

Final: Temperature ______ °C; pH ______ ; Sp. Conductance ______ µS.

Pump\bailer depth: 39.0 feet.

Volume Purged: 5.0 gallons; Rate of Purge: 0.1 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Purged dry sampled first recovery.

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-3-98

Well No: MW-20B Time Sample Taken: 1615

Well Total Depth: 57.0 Casing Head Elevation: 596.76

Depth to Water: 27.85 Elevation of Water Level: 568.91

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 18.3 °C; pH 5.98 ; Sp. Conductance 1223 µS.

Intermed: Temperature 17.9 °C; pH 6.04 ; Sp. Conductance 1320 µS.

Final: Temperature 17.6 °C; pH 6.10 ; Sp. Conductance 1380 µS.

Pump\bailer depth: 40.0 feet.

Volume Purged: 13.0 gallons; Rate of Purge: 0.5 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ______

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-9-98

Well No: MW-22R Time Sample Taken: 0935

Well Total Depth: 40.0 Casing Head Elevation: 596.76

Depth to Water: 27.13 Elevation of Water Level: 569.63

Tubing Size: 4"

PURGE VOLUME CALCULATION:

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 14.6 °C; pH 6.49 ; Sp. Conductance 1633 µS.

Intermed: Temperature 16.7 °C; pH 6.43 ; Sp. Conductance 2061 µS.

Final: Temperature 16.9 °C; pH 6.48 ; Sp. Conductance 1986 µS.

Pump\bailer depth: 39.0 feet.

Volume Purged: 9.0 gallons; Rate of Purge: 0.2 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ______

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-3-98

Well No: MW-23A Time Sample Taken: 1420

Well Total Depth: 35.0 Casing Head Elevation: 598.82

Depth to Water: 28.53 Elevation of Water Level: 570.29

Tubing Size: 4"

Type of Purge: Bailer ______ or Pump X

Initial: Temperature 18.1 °C; pH 7.04 ; Sp. Conductance 770 µS.

Intermed: Temperature 17.7 °C; pH 6.95 ; Sp. Conductance 653 µS.

Final: Temperature 17.6 °C; pH 6.63 ; Sp. Conductance 648 µS.

Pump\bailer depth: 34.0 feet.

Volume Purged: 5.5 gallons; Rate of Purge: 0.1 gal/min.

Sample Protocol: See Chain-of-Custody

Comments:

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-9-98

Well No: MW-24A Time Sample Taken: 1100

Well Total Depth: 35.00 Casing Head Elevation: 594.58

Depth to Water: 26.82 Elevation of Water Level: 567.76

Tubing Size: 4"

Type of Purge: Bailer X or Pump ______

Initial: Temperature 15.8 °C; pH 6.93 ; Sp. Conductance 2918 μS.

Intermed: Temperature ______ °C; pH ______; Sp. Conductance ______ μS.

Final: Temperature ______ °C; pH ______; Sp. Conductance ______ μS.

Pump\bailer depth: 35.0 feet.

Volume Purged: 9.0 gallons; Rate of Purge: 0.4 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ______

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-8-98

Well No: TD-5 Time Sample Taken: 1800

Well Total Depth: 30.4 Casing Head Elevation: 589.49

Depth to Water: 23.06 Elevation of Water Level: 566.43

Tubing Size: 2"

PURGE VOLUME CALCULATION:

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 14.1 °C; pH 6.00 ; Sp. Conductance 1423 µS.

Intermed: Temperature 15.0 °C; pH 6.21 ; Sp. Conductance 1461 µS.

Final: Temperature 15.1 °C; pH 6.10 ; Sp. Conductance 1472 µS.

Pump\bailer depth: 29.0 feet.

Volume Purged: 12 gallons; Rate of Purge: 0.4 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: ____

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-8-98

Well No: WT-13A Time Sample Taken: 1730

Well Total Depth: 35.06 Casing Head Elevation: 590.82

Depth to Water: 24.56 Elevation of Water Level: 566.26

Tubing Size: 4"

Type of Purge: Bailer ____ or Pump X

Initial: Temperature 15.2 °C; pH 6.13 ; Sp. Conductance 626 µS.

Intermed: Temperature 15.8 °C; pH 6.04 ; Sp. Conductance 676 µS.

Final: Temperature 15.7 °C; pH 6.08 ; Sp. Conductance 663 µS.

Pump\bailer depth: 33.0 feet.

Volume Purged: 12.0 gallons; Rate of Purge: 0.4 gal/min.

Sample Protocol: See Chain-of-Custody

Comments:

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-8-98

Well No: WT-14A Time Sample Taken: 1600

Well Total Depth: 29.29 Casing Head Elevation: 593.57

Depth to Water: 26.83 Elevation of Water Level: 566.74

Tubing Size: 4"

Type of Purge: Bailer______ or Pump X

Initial: Temperature 16.6 °C; pH 7.68 ; Sp. Conductance 8.53 mS.

Intermed: Temperature ______ °C; pH ______; Sp. Conductance ______ mS.

Final: Temperature ______ °C; pH ______; Sp. Conductance ______ mS.

Pump\bailer depth: 29.0 feet.

Volume Purged: 8 gallons; Rate of Purge: 0.3 gal/min.

Sample Protocol: See Chain-of-Custody

Comments: Purged dry, sampled first recovery.

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

Potesta & Associates, Inc.

Monitoring Well Sampling Report

Well Location: Monsanto Performance Monitoring Date: 12-8-98

Well No: WT-15A Time Sample Taken: 1640

Well Total Depth: 24.87 Casing Head Elevation: 589.08

Depth to Water: 8.52 Elevation of Water Level: 580.56

Tubing Size: 4"

Type of Purge: Bailer________ or Pump________

Initial: Temperature 16.1 °C; pH 6.23 ; Sp. Conductance 579 µS.

Intermed: Temperature 15.9 °C; pH 5.83 ; Sp. Conductance 603 µS.

Final: Temperature 15.9 °C; pH 5.81 ; Sp. Conductance 591 µS.

Pump\bailer depth: 24.0 feet.

Volume Purged: 7.8 gallons; Rate of Purge: 0.3 gal/min.

Sample Protocol: See Chain-of-Custody

Comments:

Sampler: Dave Junker
SWL - Static Water Level
Tubing Volume Factors: 2" = .17; 4" = .64;

APPENDIX B

PAST DISPOSAL AREA
EXTRACTION WELL DRILLING LOGS/
WELL CONSTRUCTION DETAILS

TERRADON CORPORATION

MONSANTO CHEMICAL COMPANY NITRO, WV, LNAPL RECOVERY AREA

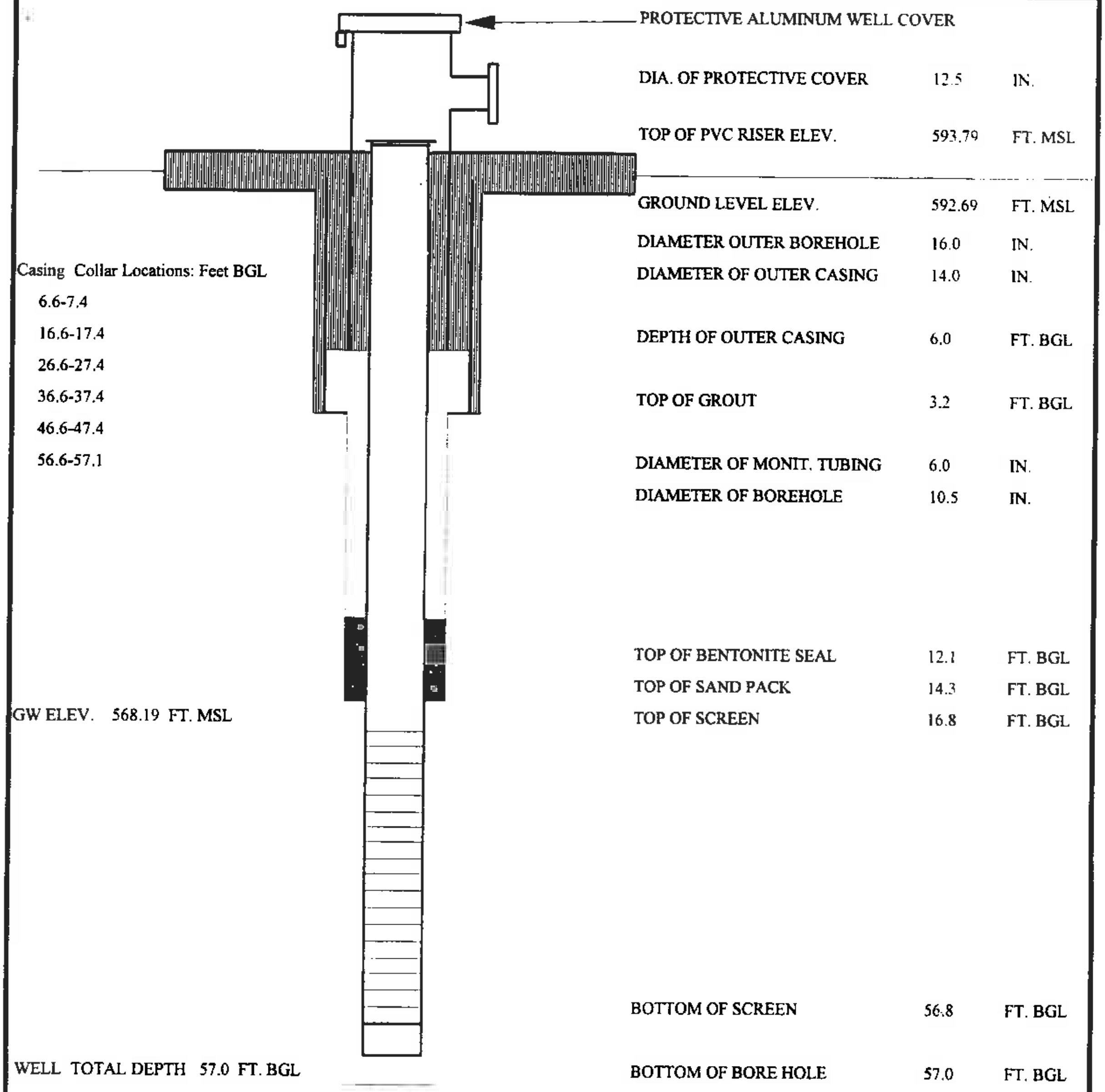
VISUAL DESCRIPTION OF SOILS

PROJECT NO.: 95x308	TASK NO.:	DESCRIPTION: LNAPL Recovery well
BORING/WELL NO.: EW-2	LAT. / LONG.:38-26-32.205/81-50-37.939	DATE:
ELEVATION: 592.38 MSL	GWL: DEPTH 25.9 DATE / TIME 11-20-95 1420 HRS	DATE STARTED: 11-20-95
GEOLOGIST: D.Junker	GWL: DEPTH DATE / TIME	DATE COMPD:11-20-95
DRILLING METHODS:	Auger rig - 6.25" (ID) Hollow Stemmed Auger	PAGE 1 OF 1

DEPTH IN FEET	SAMPLE NO. & TIME	BLOW COUNT PER 6 IN.	RECOVER IN INCHES	SOIL DESCRIPTION INCLUDING THE FOLLOWING: COLOR / CONSISTENCY OR DENSITY / MOISTURE CONTENT / GRAIN SIZE / TYPE / USCS SYMBOL / REMARKS
2				0.0-0.9 Limestone gravel and red silty clay, firm, moist, plastic, (fill material and cover)
4				0.9-5.2 Clay and silty clay, brown to black alternating, moist, firm, slight petroleum odor.
6				5.2-6.5 Silty clay, brown to tan varigated, sandy in part, firm, moist, sticky, no odor.
8				
10	10'-12'	7,9,10,12	24	Silty clay loam, sandy in part, reddish brown, firm, slightly moist, slightly sticky, no odor.
12				
14				
16	15'-17'	4,4,3,3	24	Silty clay loam, reddish brown, as above, soft, friable, slightly moist,
18				
20	20'-22'	4,2,3,3	24	Sandy silt (loam), sand fine grained, red/brown, soft, friable, slightly moist,
22				slight petroleum odor.
24				
26	25'-27'	3,3,4,5	24	Sandy silt (loam), as above, 1" clay stringer at 25.2.
28				Sand, w/ minor silt at 25.3 +, gray brown, med. to fine sand, micaceous, saturated, strong
30				petroleum odor, black staining as variegation.
32	30'-30.5'	3,3,4,5	24	Sandy silt (silt loam), sand very fine, gray brown, micaceous as above, soft, saturated, no odor.
34	30.5'-32'			Silty sand, minor clay, red to red brown, soft to med. firm, saturated, no odor.
36	35'-37	WOT	22	Sandy silt w/minor clay (silt loam), gray brown, micaceous, soft, saturated, minor gray med
38				sand stringers.
40	40'-42'	WOT	21	Sand w/ minor silt, gray green w/ red gray variegations, sand fine to very fine, micaceous,
42				saturated, heaving capacity.
44				
46	45-47'	WOT	19	Sand , gray green, sand medium to coarse, some minor pebbles (2-4 mm), saturated, high
48				porosity and permeability
50	50'-52'	WOT	20	Sand w/silt, red brown, sand fine to medium, micaceous, saturated, black shale pebbles and
52				pieces. Sand heaving.
54				
56	55'-56.6	WOT, 6	23	Sand w/ pebbles (2-4 cm), gray green sand, pebbles dark gray to black shale, sand medium to
58				coarse, saturated, high porosity and permeability, heaving capacity. 56.6-57' gray to black shale
60	56.6- 60.0			Bedrock at 57' , gray to black weathered shale, soft to 58.3'. Last three feet of hole was
				examined from cuttings from cable tool clean out after driving 10' casing.
				TD 60.0 GL
				Water at 25.9 BGL

TERRADON CORPORATION

RECOVERY WELL INSTALLATION DIAGRAM



MATERIALS USED:

SAND TYPE & QUANTITY. 33 X 50Lb BAGS OF SILICA SAND
BENTONITE 1 X50 lb. BUCKETS OF 1/2" BENTONITE PELLETS
AMOUNT OF CEMENT: 3 X 94lb. BAGS OF PORTLAND CEMENT
15 lb.. OF BENTONITE GEL
AMOUNT OF WATER USED: 33 GALLONS
OTHER: #1 MORIE EQUIVILANT SAND USED

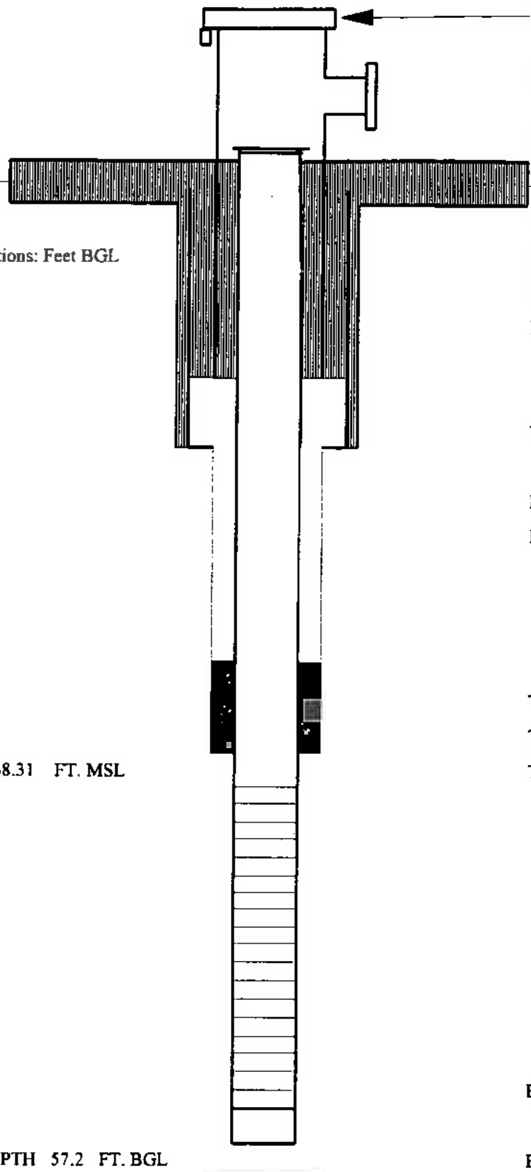
COMPANY:	MONSANTO COMPANY, NITRO, WV.
LOCATION:	LNAPL AREA
MONITORING WELL NO. :	EW-1
SEA LEVEL ELEVATION:	593.79
INSTALLATION DATE:	12/7/95
GEOLOGIST:	D. N. JUNKER
PROJECT NO. :	95X308

BGL - Below Ground Level MSL - Mean Sea Level All diameters Inside Diameter

Note: Monitored tubing is 6" Johnson PVC riser and V-slot, wire wrapped screen. Screen has 10 slot openings.

TERRADON CORPORATION

RECOVERY WELL INSTALLATION DIAGRAM



PROTECTIVE ALUMINUM WELL COVER		
DIA. OF PROTECTIVE COVER	12.0	IN.
TOP OF PVC RISER ELEV.	593.6	FT. MSL
GROUND LEVEL ELEV.	592.4	FT. MSL
DIAMETER OUTER BOREHOLE	16.0	IN.
DIAMETER OF OUTER CASING	14.0	IN.
DEPTH OF OUTER CASING	6.5	IN.
TOP OF GROUT	5.0	FT. BGL
DIAMETER OF MONIT. TUBING	6.0	IN.
DIAMETER OF BOREHOLE	10.5	IN.
TOP OF BENTONITE SEAL	12.7	FT. BGL
TOP OF SAND PACK	14.0	FT.BGL
TOP OF SCREEN	12.0	FT. BGL
BOTTOM OF SCREEN	57.3	FT. BGL
BOTTOM OF BORE HOLE	57.5	FT. BGL

Casing Collar Locations: Feet BGL

7.1 - 7.9 Feet

17.1- 17.9

27.1-27.9

37.1-37.9

47.1-47.9

57.1-57.5

GW ELEV. 568.31 FT. MSL

WELL TOTAL DEPTH 57.2 FT. BGL

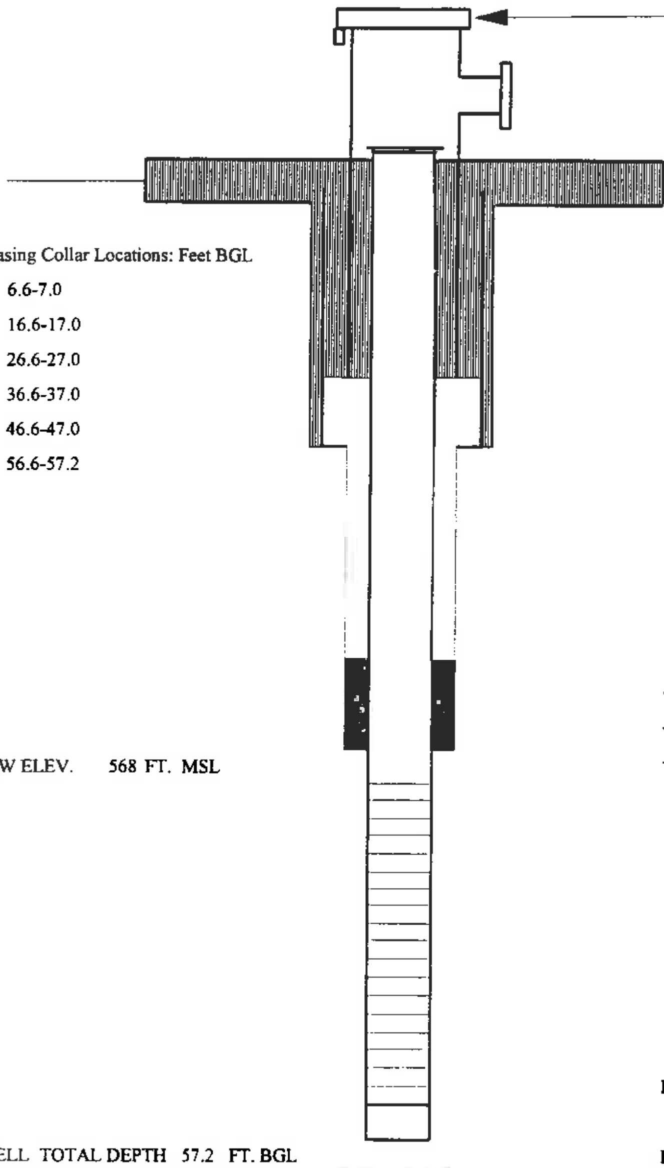
MATERIALS USED:	
SAND TYPE & QUANTITY: 33 X 50Lb BAGS OF SILICA SAND	COMPANY: MONSANTO COMPANY, NITRO, WV.
BENTONITE 1 X50 lb. BUCKETS OF 1/2" BENTONITE PELLETS	LOCATION: LNAPL AREA
AMOUNT OF CEMENT: 3 X 94lb BAGS OF PORTLAND CEMENT	MONITORING WELL NO. : EW-2
15 lb. OF BENTONITE GEL	SEA LEVEL ELEVATION: 593.57
AMOUNT OF WATER USED: 33 GALLONS	INSTALLATION DATE: 12/4/95
OTHER: #1 MORIE EQUIVILANT SAND USED	GEOLOGIST: D. N. JUNKER
	PROJECT NO. : 95X308

BGL - Below Ground Level MSL - Mean Sea Level All diameters Inside Diameter

Note: Monitored tubing is 6" Johnson PVC riser and V-slot, wire wrapped screen. Screen has 10 slot openings.

TERRADON CORPORATION

RECOVERY WELL INSTALLATION DIAGRAM



PROTECTIVE ALUMINUM WELL COVER		
DIA. OF PROTECTIVE COVER	12.0	IN.
TOP OF PVC RISER ELEV.	593.7	FT. MSL
GROUND LEVEL ELEV.	592.9	FT. MSL
DIAMETER OUTER BOREHOLE	16.0	IN.
DIAMETER OF OUTER CASING	16.0	IN.
TOP OF GROUT	4.5	FT. BGL
DIAMETER OF MONIT. TUBING	6.0	IN.
DIAMETER OF BOREHOLE	10.5	IN.
TOP OF BENTONITE SEAL	12.5	FT. BGL
TOP OF SAND PACK	14.8	FT. BGL
TOP OF SCREEN	16.9	FT. BGL
BOTTOM OF SCREEN	56.6	FT. BGL
BOTTOM OF BORE HOLE	59.0	FT. BGL

Casing Collar Locations: Feet BGL

6.6-7.0
16.6-17.0
26.6-27.0
36.6-37.0
46.6-47.0
56.6-57.2

GW ELEV. 568 FT. MSL

WELL TOTAL DEPTH 57.2 FT. BGL

MATERIALS USED:

SAND TYPE & QUANTITY: 36 X 50Lb BAGS OF SILICA SAND

BENTONITE: 1 X50 lb. BUCKETS OF 1/2" BENTONITE PELLETS

AMOUNT OF CEMENT: 3 X 94lb. BAGS OF PORTLAND CEMENT

15 lb.. OF BENTONITE GEL

AMOUNT OF WATER USED: 32 GALLONS

OTHER: #1 MORIE EQUIVILANT SAND USED

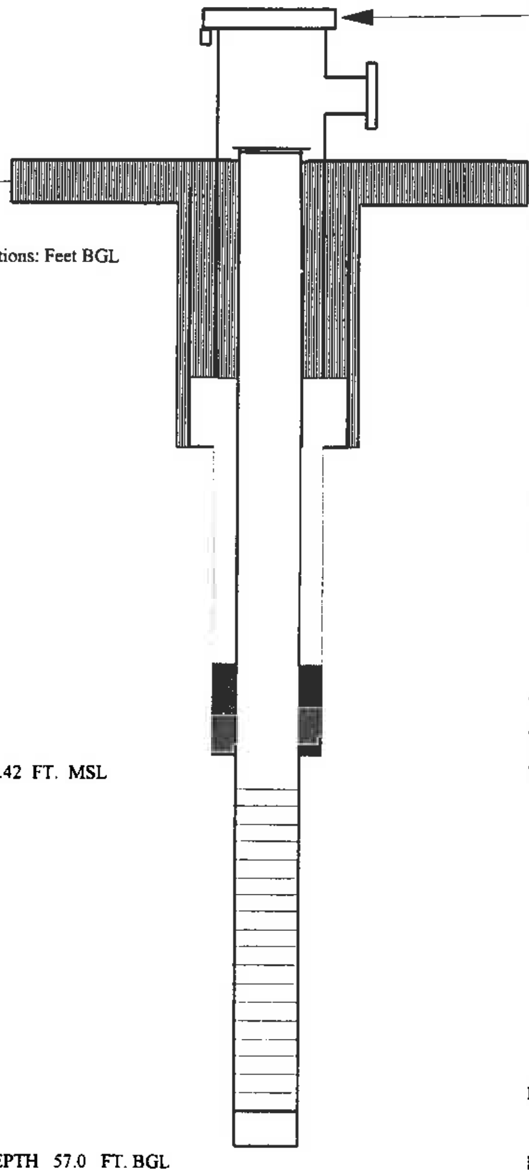
COMPANY:	MONSANTO COMPANY, NITRO, WV.
LOCATION:	LNAPL AREA
MONITORING WELL NO. :	EW-3
SEA LEVEL ELEVATION:	593.68
INSTALLATION DATE:	35030.00
GEOLOGIST:	D. N. JUNKER
PROJECT NO. :	95X308

BGL - Below Ground Level   MSL - Mean Sea Level   All diameters Inside Diameter

Note: Monitored tubing is 6" Johnson PVC riser and V-slot, wire wrapped screen. Screen has 10 slot openings.

TERRADON CORPORATION

RECOVERY WELL INSTALLATION DIAGRAM



PROTECTIVE ALUMINUM WELL COVER

DIA. OF PROTECTIVE COVER	12.0	IN.
TOP OF PVC RISER ELEV.	592.9	FT. MSL
GROUND LEVEL ELEV.	592.3	FT. MSL
DIAMETER OUTER BOREHOLE	16.0	IN.
DIAMETER OF OUTER CASING	14.0	IN.
TOP OF GROUT	3.9	FT. BGL
DIAMETER OF MONIT. TUBING	6.0	IN.
DIAMETER OF BOREHOLE	10.5	IN.
TOP OF BENTONITE SEAL	13.0	FT. BGL
TOP OF SAND PACK	15.0	FT. BGL
TOP OF SCREEN	17.0	FT.BGL
BOTTOM OF SCREEN	56.5	FT. BGL
BOTTOM OF BORE HOLE	57.5	FT. BGL

Casing Collar Locations: Feet BGL

6.2-7.0
16.4-17.2
26.4-27.2
36.4-37.2
46.4-47.2
56.4-57.0

GW ELEV. 568.42 FT. MSL

WELL TOTAL DEPTH 57.0 FT. BGL

MATERIALS USED:

SAND TYPE & QUANTITY: 33 X 50Lb BAGS OF SILICA SAND

BENTONITE 1 X50 lb. BUCKETS OF 1/2" BENTONITE PELLETS

AMOUNT OF CEMENT 3 X 94lb. BAGS OF PORTLAND CEMENT

15 lb.. OF BENTONITE GEL

AMOUNT OF WATER USED: 33 GALLONS

OTHER: #1 MORIE EQUIVILANT SAND USED

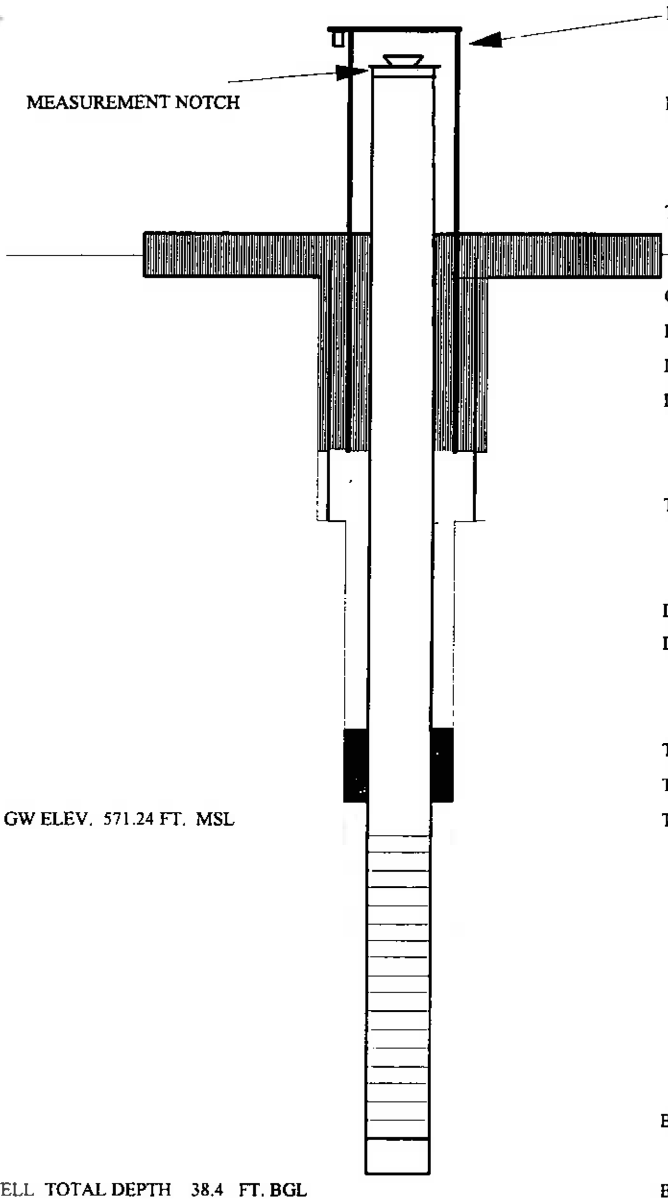
COMPANY:	MONSANTO COMPANY, NITRO, WV.
LOCATION:	LNAPL AREA
MONITORING WELL NO. :	EW-4
SEA LEVEL ELEVATION:	592.92
INSTALLATION DATE:	12/4/95
GEOLOGIST:	D. N. JUNKER
PROJECT NO. :	95X308

BGL - Below Ground Level MSL - Mean Sea Level All diameters Inside Diameter

Note: Monitored tubing is 6" Johnson PVC riser and V-slot, wire wrapped screen Screen has 10 slot openings.

TERRADON CORPORATION

MONITORING WELL INSTALLATION DIAGRAM



DIA. OF PROTECTIVE COVER	8.0	IN.
TOP OF PVC RISER ELEV.	595.64	FT. MSL
GROUND LEVEL ELEV.	592.72	FT. MSL
DIAMETER OUTER BOREHOLE	16.0	IN.
DIAMETER OF OUTER CASING	14.0	IN.
DEPTH OF OUTER CASING	5.0	FT. BGL
TOP OF GROUT	2.5	FT BGL
DIAMETER OF BOREHOLE	10.25	IN.
DIAMETER OF MONIT. TUBING	4.0	IN.
TOP OF BENTONITE SEAL	18.0	FT. BGL
TOP OF SAND PACK	20.0	FT. BGL
TOP OF SCREEN	23.4	FT.BGL
BOTTOM OF SCREEN	38.4	FT. BGL
BOTTOM OF BORE HOLE	39.5	FT.BGL

GW ELEV. 571.24 FT. MSL

WELL TOTAL DEPTH 38.4 FT. BGL

MATERIALS USED:

SAND TYPE & QUANTITY: 17 X 50Lb BAGS OF SILICA SAND

BENTONITE 1 X50 lb. BUCKETS OF 1/2" BENTONITE PELLETS

AMOUNT OF CEMENT 2 X 94lb. BAGS OF PORTLAND CEMENT

10 lb. OF BENTONITE GEL

AMOUNT OF WATER USED 22 GALLONS

OTHER: #1 MORIE EQUIVALENT SAND USED

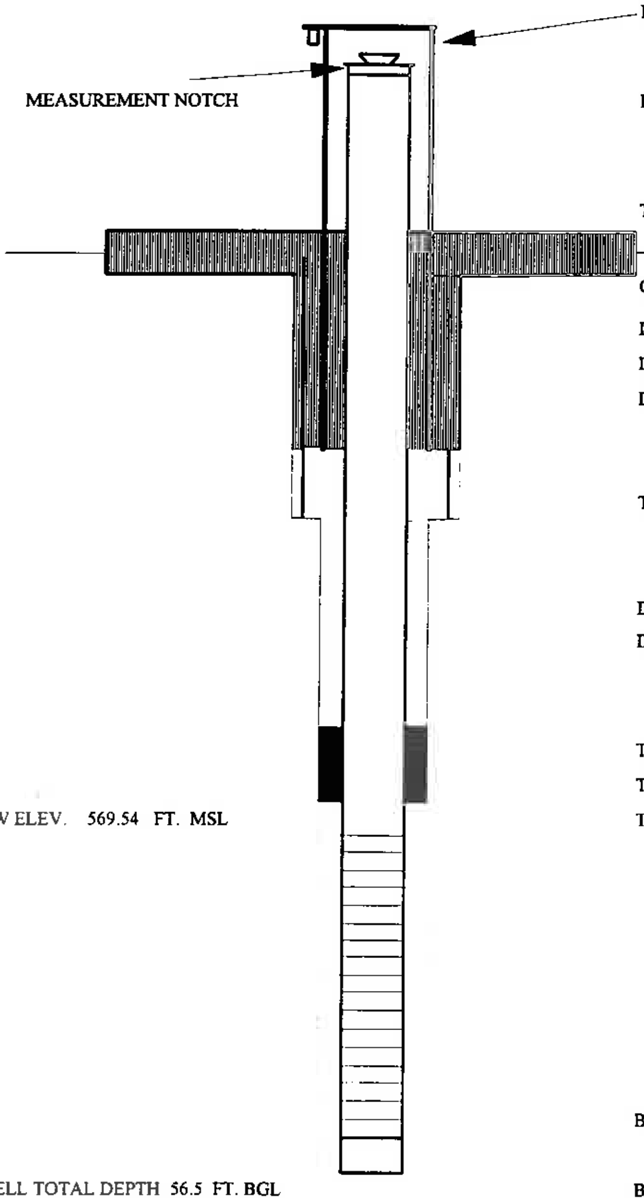
NOTE: BGL - BELOW GROUND LEVEL MSL - MEAN SEA LEVEL

COMPANY:	MONSANTO COMPANY, NITRO, WV.
LOCATION:	LNAPL AREA
MONITORING WELL NO. :	B-8A
SEA LEVEL ELEVATION:	595.64
INSTALLATION DATE:	11/28/95
GEOLOGIST:	D. N. JUNKER
PROJECT NO. :	95X308

NOTE. MONITORED TUBING 4" JOHNSON PVC RISER AND 10 SLOT STANDARD SCREEN.

TERRADON CORPORATION

MONITORING WELL INSTALLATION DIAGRAM



DIA. OF PROTECTIVE COVER	8.0	IN.
TOP OF PVC RISER ELEV.	595.7	FT. MSL
GROUND LEVEL ELEV.	592.7	FT. MSL
DIAMETER OUTER BOREHOLE	16.0	IN.
DIAMETER OF OUTER CASING	14.0	IN.
DEPTH OF OUTER CASING	6.0	FT.BGL
TOP OF GROUT	2.8	FT.BGL
DIAMETER OF BOREHOLE	10.25	IN.
DIAMETER OF MONIT. TUBING	4.0	IN.
TOP OF BENTONITE SEAL	32.5	FT.BGL
TOP OF SAND PACK	34.7	FT. BGL
TOP OF SCREEN	37.0	FT.BGL
BOTTOM OF SCREEN	57.0	FT.BGL
BOTTOM OF BORE HOLE	57.5	FT.BGL

GW ELEV. 569.54 FT. MSL

WELL TOTAL DEPTH 56.5 FT. BGL

MATERIALS USED:

SAND TYPE & QUANTITY: 20 X 50Lb BAGS OF SILICA SAND

BENTONITE 1 X50 lb. BUCKETS OF 1/2" BENTONITE PELLETS

AMOUNT OF CEMENT: 4 X 94lb. BAGS OF PORTLAND CEMENT

20 lb.. OF BENTONITE GEL

AMOUNT OF WATER USED: 44 GALLONS

OTHER: #1 MORIE EQUIVALENT SAND USED

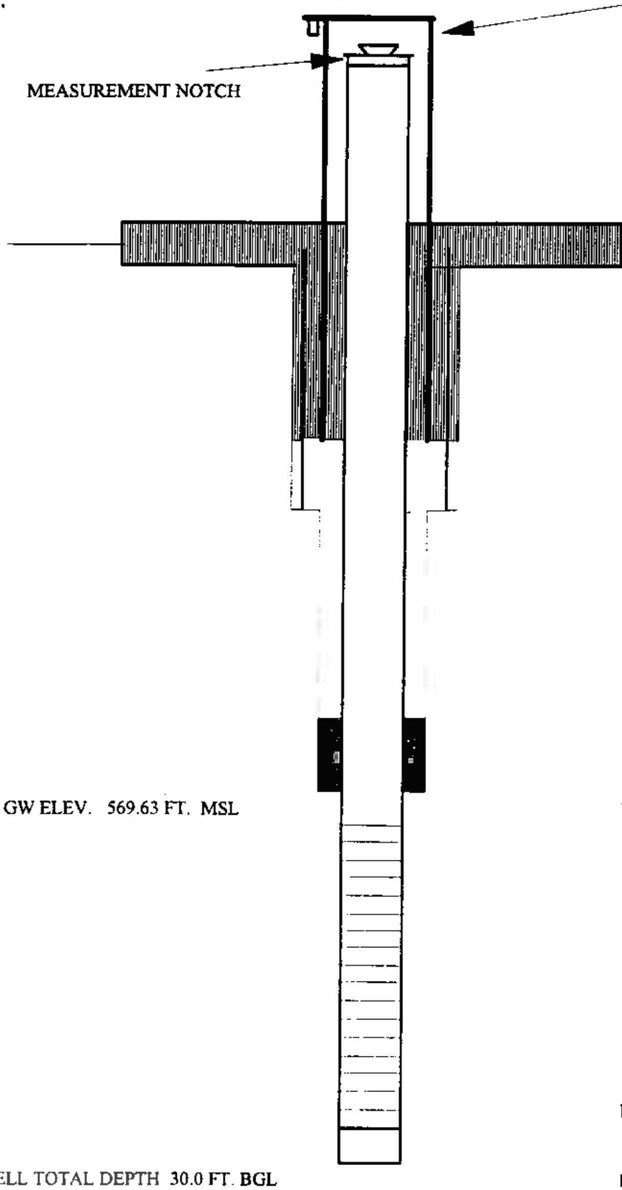
NOTE: BGL - BELOW GROUND LEVEL MSS - MEAN SEA LEVEL

COMPANY:	MONSANTO COMPANY, NITRO, WV.
LOCATION:	LNAPL AREA
MONITORING WELL NO. :	**B-8B**
SEA LEVEL ELEVATION:	595.69
INSTALLATION DATE:	12/13/95
GEOLOGIST:	D. N. JUNKER
PROJECT NO. :	95X308

NOTE: MONITORED TUBING 4" JOHNSON PVC RISER AND 10 SLOT STANDARD SCREEN.

TERRADON CORPORATION

MONITORING WELL INSTALLATION DIAGRAM



DIA. OF PROTECTIVE COVER	8.0	IN.
TOP OF PVC RISER ELEV.	594.23	FT. MSL
GROUND LEVEL ELEV.	591.16	FT. MSL
DIAMETER OUTER BOREHOLE	16.0	IN.
DIAMETER OF OUTER CASING	14.0	IN.
DEPTH OF OUTER CASING	16.0	FT. BGL
TOP OF GROUT	2.5	FT. BGL
DIAMETER OF BOREHOLE	10.25	IN.
DIAMETER OF MONIT. TUBING	4.0	IN.
TOP OF BENTONITE SEAL 19.4	19.4	FT. BGL
TOP OF SAND PACK 21.7	21.7	FT. BGL
TOP OF SCREEN 24.0	24.0	FT. BGL
BOTTOM OF SCREEN	39.0	FT. BGL
BOTTOM OF BORE HOLE	39.5	FT. BGL

MATERIALS USED:

SAND TYPE & QUANTITY 17 X 50Lb BAGS OF SILICA SAND

BENTONITE 1 X50 lb. BUCKETS OF 1/2" BENTONITE PELLETS

AMOUNT OF CEMENT: 2 X 94lb. BAGS OF PORTLAND CEMENT

10 lb.. OF BENTONITE GEL

AMOUNT OF WATER USED. 22 GALLONS

OTHER: #1 MORIE EQUIVILENT SAND USED

NOTE: BGL - BELOW GROUND LEVEL MSL - MEAN SEA LEVEL

COMPANY:	MONSANTO COMPANY, NITRO, WV.
LOCATION:	LNAPL AREA
MONITORING WELL NO.	B-9
SEA LEVEL ELEVATION:	594.23
INSTALLATION DATE:	11/28/95
GEOLOGIST:	D. N. JUNKER
PROJECT NO. :	95X308

NOTE. MONITORED TUBING 4" JOHNSON PVC RISER AND 10 SLOT STANDARD SCREEN

APPENDIX C

Past Disposal Area
Well Sampling/Monitoring Logs

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	9/12/95
Site Location:	LNAPL Unit	*Time In:*	
Project Number:	97026	*Time Out:*	
Weather Conditions:	°F		

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick (ft)	Corr. Water Table Elev	Observations
EW-1	593.79	n/a	n/a	-	-	
EW-2	593.57	n/a	n/a	-	-	
EW-3	593.68	n/a	n/a	-	-	
EW-4	582.92	n/a	n/a	-	-	
MW-7	594.03	26.75	28.59	1.84	566.88	
W-1	594.96	27.79	29.02	1.23	566.90	
R-1	592.94	-	25.89	0.00	567.05	
R-2	592.92	n/a	n/a	-	-	no access
B-1	594.98	27.77	29.46	1.69	566.84	
B-2	592.87	25.57	26.80	1.23	567.03	
B-3	595.14	27.80	29.76	1.96	566.91	
B-4	593.82	26.76	27.15	0.39	566.97	
B-5	578.92	-	12.31	0.00	566.61	
B-6	575.66	-	9.33	0.00	566.33	
B-7	577.37	-	11.23	0.00	566.14	
B-8A	595.64	n/a	n/a	-	-	
B-8B	595.69	n/a	n/a	-	-	
B-9	594.23	n/a	n/a	-	-	

Depth in Product Storage Tank (ft):

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	7/16/96
Site Location:	LNAPL Unit	*Time In:*	
Project Number:	97026	*Time Out:*	
Weather Conditions:	°F		

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick (ft)	Corr. Water Table Elev.	Observations
EW-1	593.79	n/a	n/a	-	-	
EW-2	593.57	n/a	n/a	-	-	
EW-3	593.68	n/a	n/a	-	-	
EW-4	582.92	n/a	n/a	-	-	
MW-7	594.03	27.70	30.10	2.40	565.80	
W-1	594.96	28.41	28.86	0.45	566.45	
R-1	592.94	-	26.31	0.00	566.63	
R-2	592.92	n/a	n/a	-	-	no access
B-1	594.98	28.06	29.75	1.69	566.55	
B-2	592.87	25.91	27.58	1.67	566.59	
B-3	595.14	28.16	30.36	2.20	566.50	
B-4	593.82	-	27.18	0.00	566.64	
B-5	578.92	n/a	n/a	-	-	
B-6	575.66	n/a	n/a	-	-	
B-7	577.37	n/a	n/a	-	-	
B-8A	595.64	n/a	n/a	-	-	
B-8B	595.69	n/a	n/a	-	-	
B-9	594.23	n/a	n/a	-	-	

Depth in Product Storage Tank (ft):

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	10/28/97
Site Location:	LNAPL Unit	*Time In:*	
Project Number:	97026	*Time Out:*	
Weather Conditions:	°F		

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick (ft)	Corr Water Table Elev	Observations
EW-1	593.79	26.60	27.98	1.38	566.89	Site Pro Pump (inoperative)
EW-2	593.57	-	26.64	0.00	566.93	
EW-3	593.68	-	26.72	0.00	566.96	
EW-4	582.92	-	25.86	0.00	557.06	
MW-7	594.03	26.91	28.90	1.99	566.68	
W-1	594.96	28.10	28.20	0.10	566.84	
R-1	592.94	-	26.02	0.00	566.92	
R-2	592.92	25.75	27.29	1.54	566.83	
B-1	594.98	n/a	n/a	-	-	Ferret Passive Pump
B-2	592.87	26.45	27.57	1.12	566.17	Ferret Passive Pump
B-3	595.14	27.86	29.95	2.09	566.82	Ferret Passive Pump
B-4	593.82	26.80	27.55	0.75	566.86	
B-5	578.92	n/a	n/a	-	-	
B-6	575.66	n/a	n/a	-	-	
B-7	577.37	n/a	n/a	-	-	
B-8A	595.64	n/a	n/a	-	-	
B-8B	595.69	n/a	n/a	-	-	
B-9	594.23	n/a	n/a	-	-	

Depth in Product Storage Tank (ft):

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	11/3/97
Site Location:	LNAPL Unit	*Time In:*	
Project Number:	97026	*Time Out:*	
Weather Conditions:	°F		

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick. (ft)	Corr. Water Table Elev.	Observations
EW-1	593.79	26.65	28.15	1.50	566.81	Site Pro Pump (inoperative)
EW-2	593.57	-	26.70	0.00	566.87	
EW-3	593.68	-	26.80	0.00	566.88	
EW-4	582.92	-	25.92	0.00	557.00	
MW-7	594.03	26.85	28.75	1.90	566.76	
W-1	594.96	28.15	28.26	0.11	566.79	
R-1	592.94	-	26.10	0.00	566.84	
R-2	592.92	25.81	27.25	1.44	566.79	
B-1	594.98	28.10	30.10	2.00	566.44	Ferret Passive Pump
B-2	592.87	26.50	27.71	1.21	566.10	Ferret Passive Pump
B-3	595.14	27.83	29.88	2.05	566.86	Ferret Passive Pump
B-4	593.82	26.78	27.61	0.83	566.86	
B-5	578.92	-	12.31	0.00	566.61	
B-6	575.66	-	9.25	0.00	566.41	
B-7	577.37	-	11.50	0.00	565.87	
B-8A	595.64	n/a	n/a	-	-	
B-8B	595.69	n/a	n/a	-	-	
B-9	594.23	n/a	n/a	-	-	

Depth in Product Storage Tank (ft):

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	11/20/97
Site Location:	LNAPL Unit	*Time In:*	
Project Number:	97026	*Time Out:*	
Weather Conditions:	°F		

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick. (ft)	Corr. Water Table Elev.	Observations
EW-1	593.79	26.56	28.00	1.44	566.91	Site Pro Pump (inoperative)
EW-2	593.57	-	26.58	0.00	566.99	
EW-3	593.68	-	26.59	0.00	567.09	
EW-4	582.92	-	26.68	0.00	556.24	
MW-7	594.03	27.26	30.20	2.94	566.12	
W-1	594.96	28.02	28.25	0.23	566.89	
R-1	592.94	-	25.92	0.00	567.02	
R-2	592.92	25.67	27.22	1.55	566.91	
B-1	594.98	30.62	30.65	0.03	564.35	Ferret Passive Pump
B-2	592.87	26.35	27.45	1.10	566.28	Ferret Passive Pump
B-3	595.14	27.81	29.81	2.00	566.89	Ferret Passive Pump
B-4	593.82	26.69	27.82	1.13	566.88	
B-5	578.92	n/a	n/a	-	-	
B-6	575.66	n/a	n/a	-	-	
B-7	577.37	n/a	n/a	-	-	
B-8A	595.64	n/a	n/a	-	-	
B-8B	595.69	n/a	n/a	-	-	
B-9	594.23	n/a	n/a	-	-	

Depth in Product Storage Tank (ft):

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	12/16/97
Site Location:	LNAPL Unit	*Time In:*	
Project Number:	97026	*Time Out:*	
Weather Conditions:	45 °F	Overcast, Rain-AM	

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick. (ft)	Corr. Water Table Elev.	Observations
EW-1	593.79	n/a	n/a	-	-	Site Pro Pump (inoperative)
EW-2	593.57	-	26.72	0.00	566.85	
EW-3	593.68	-	26.78	0.00	566.90	
EW-4	582.92	-	25.95	0.00	556.97	
MW-7	594.03	26.9	30.52	3.62	566.33	
W-1	594.96	28.2	28.4	0.20	566.72	
R-1	592.94	-	26.2	0.00	566.74	
R-2	592.92	25.8	27.49	1.69	566.75	
B-1	594.98	n/a	n/a	-	-	Ferret Passive Pump
B-2	592.87	26.5	27.8	1.30	566.08	Ferret Passive Pump
B-3	595.14	n/a	n/a	-	-	Ferret Passive Pump
B-4	593.82	26.71	28.45	1.74	566.73	
B-5	578.92	n/a	n/a	-	-	
B-6	575.66	n/a	n/a	-	-	
B-7	577.37	n/a	n/a	-	-	
B-8A	595.64	n/a	n/a	-	-	
B-8B	595.69	n/a	n/a	-	-	
B-9	594.23	n/a	n/a	-	-	

Depth in Product Storage Tank (ft):

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	1/28/98
Site Location:	LNAPL Unit	*Time In:*	
Project Number:	97026	*Time Out:*	
Weather Conditions:	45 °F	Overcast, Rain-AM	

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick (ft)	Corr. Water Table Elev.	Observations
EW-1	593.79	26.32	27.15	0.83	567.29	Site Pro Pump (inoperative)
EW-2	593.57	-	26.23	0.00	567.34	
EW-3	593.68	-	26.33	0.00	567.35	
EW-4	582.92	-	25.53	0.00	557.39	
MW-7	594.03	26.65	28.01	1.36	567.08	
W-1	594.96	27.69	27.9	0.21	567.22	
R-1	592.94	-	25.66	0.00	567.28	
R-2	592.92	25.61	26.08	0.47	567.21	
B-1	594.98	27.69	29.03	1.34	567.00	Ferret Passive Pump
B-2	592.87	25.41	26.42	1.01	567.24	Ferret Passive Pump
B-3	595.14	28.11	29.6	1.49	566.70	Ferret Passive Pump
B-4	593.82	26.48	27.21	0.73	567.18	
B-5	578.92	n/a	n/a	-	-	
B-6	575.66	n/a	n/a	-	-	
B-7	577.37	n/a	n/a	-	-	
B-8A	595.64	n/a	n/a	-	-	
B-8B	595.69	n/a	n/a	-	-	
B-9	594.23	n/a	n/a	-	-	

Depth in Product Storage Tank (ft):

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	3/2/98
Site Location:	LNAPL Unit	*Time In:*	
Project Number:	97026	*Time Out:*	
Weather Conditions:	45 °F	Overcast, Rain-AM	

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick (ft)	Corr. Water Table Elev.	Observations
EW-1	593.79	n/a	n/a	-	-	Site Pro Pump (inoperative)
EW-2	593.57	-	25.9	0.00	567.67	
EW-3	593.68	-	26	0.00	567.68	
EW-4	582.92	-	25.15	0.00	557.77	
MW-7	594.03	26.35	26.66	0.31	567.61	
W-1	594.96	-	27.35	0.00	567.61	
R-1	592.94	-	25.31	0.00	567.63	
R-2	592.92	25.18	25.7	0.52	567.63	
B-1	594.98	27.34	27.9	0.56	567.52	Ferret Passive Pump
B-2	592.87	-	25.16	0.00	567.71	Ferret Passive Pump
B-3	595.14	-	27.7	0.00	567.44	Ferret Passive Pump
B-4	593.82	26.03	26.46	0.43	567.70	
B-5	578.92	-	11.78	0.00	567.14	
B-6	575.66	-	8.66	0.00	567.00	
B-7	577.37	-	10.57	0.00	566.80	
B-8A	595.64	-	28.3	0.00	567.34	
B-8B	595.69	-	28.35	0.00	567.34	
B-9	594.23	-	26.98	0.00	567.25	

Depth in Product Storage Tank (ft):

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	3/9/98
Site Location:	LNAPL Unit	*Time In:*	1345
Project Number:	97026	*Time Out:*	1520
Weather Conditions:	45 °F	Overcast, Rain-AM	

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick (ft)	Corr. Water Table Elev.	Observations
EW-1	593.79	-	26.41	0.00	567.38	Site Pro Pump (inoperative)
EW-2	593.57	-	26.15	0.00	567.42	
EW-3	593.68	-	26.22	0.00	567.46	
EW-4	582.92	-	25.36	0.00	557.56	
MW-7	594.03	26.6	27.19	0.59	567.30	
W-1	594.96	27.92	27.83	0.00	567.13	
R-1	592.94	-	25.54	0.00	567.40	
R-2	592.92	25.49	25.91	0.42	567.34	
B-1	594.98	29.4	29.8	0.40	565.49	Ferret Passive Pump
B-2	592.87	25.48	26.65	1.17	567.13	Ferret Passive Pump
B-3	595.14	-	28.55	0.00	566.59	Ferret Passive Pump
B-4	593.82	26.32	26.67	0.35	567.42	
B-5	578.92	n/a	n/a	-	-	
B-6	575.66	n/a	n/a	-	-	
B-7	577.37	n/a	n/a	-	-	
B-8A	595.64	n/a	n/a	-	-	
B-8B	595.69	n/a	n/a	-	-	
B-9	594.23	n/a	n/a	-	-	

Depth in Product Storage Tank (ft):

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	3/14/98
Site Location:	LNAPL Unit	*Time In:*	940
Project Number:	97026	*Time Out:*	1030
Weather Conditions:	35 °F	Windy/Overcast	

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick. (ft)	Corr. Water Table Elev.	Observations
EW-1	593.79	n/a	n/a	-	-	Site Pro Pump (inoperative)
EW-2	593.57	-	26.08	0.00	567.49	
EW-3	593.68	-	26.15	0.00	567.53	Slight sheen in this well.
EW-4	582.92	-	25.27	0.00	557.65	
MW-7	594.03	26.47	26.99	0.52	567.45	
W-1	594.96	27.57	27.76	0.19	567.35	
R-1	592.94	-	25.42	0.00	567.52	
R-2	592.92	25.38	25.40	0.02	567.54	
B-1	594.98	27.56	28.12	0.56	567.30	Ferret Passive Pump
B-2	592.87	25.31	25.65	0.34	567.49	Ferret Passive Pump
B-3	595.14	-	28.01	0.00	567.13	Ferret Passive Pump
B-4	593.82	26.19	26.54	0.35	567.55	
B-5	578.92	-	11.85	0.00	567.07	
B-6	575.66	-	8.80	0.00	566.86	
B-7	577.37	-	10.70	0.00	566.67	
B-8A	595.64	-	28.49	0.00	567.15	
B-8B	595.69	-	28.62	0.00	567.07	
B-9	594.23	-	27.23	0.00	567.00	

Depth in Product Storage Tank (ft): ______

Comments: ______

Equipment and/or Services Needed During Next Monitoring Visit: ______

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	3/30/98
Site Location:	LNAPL Unit	*Time In:*	1530
Project Number:	97026	*Time Out:*	1645
Weather Conditions:	85 °F Sunny		

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick (ft)	Corr. Water Table Elev.	Observations
EW-1	593.79	-	26.45	0.00	567.34	
EW-2	593.57	-	26.20	0.00	567.37	
EW-3	593.68	-	26.25	0.00	567.43	
EW-4	582.92	-	25.41	0.00	557.51	
MW-7	594.03	26.55	26.75	0.20	567.44	
W-1	594.96	27.67	27.80	0.13	567.26	
R-1	592.94	-	25.59	0.00	567.35	
R-2	592.92	25.62	25.64	0.02	567.30	
B-1	594.98	-	28.35	0.00	566.63	Pneumatic line corroded
B-2	592.87	25.43	25.60	0.17	567.40	Residue (tar-like) on pump
B-3	595.14	-	27.88	0.00	567.26	Heavy Fe deposits
B-4	593.82	26.22	26.55	0.33	567.53	
B-5	578.92	-	12.08	0.00	566.84	
B-6	575.66	-	9.00	0.00	566.66	
B-7	577.37	-	10.90	0.00	566.47	
B-8A	595.64	-	28.55	0.00	567.09	
B-8B	595.69	-	28.70	0.00	566.99	
B-9	594.23	-	27.30	0.00	566.93	

Depth in Product Storage Tank (ft):

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	4/8/98
Site Location:	LNAPL Unit	*Time In:*	1530
Project Number:	97026	*Time Out:*	1630
Weather Conditions:	75 °F Sunny		

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick (ft)	Corr Water Table Elev	Observations
EW-1	593.79	n/a	n/a	-	-	SitePro in Well
EW-2	593.57	-	26.41	0.00	567.16	
EW-3	593.68	-	26.50	0.00	567.18	
EW-4	582.92	-	25.62	0.00	557.30	
MW-7	594.03	26.81	27.36	0.55	567.10	
W-1	594.96	27.88	28.05	0.17	567.04	
R-1	592.94	-	25.80	0.00	567.14	
R-2	592.92	25.81	25.86	0.05	567.10	
B-1	594.98	n/a	n/a	-	-	Ferret in Well
B-2	592.87	25.65	25.81	0.16	567.18	
B-3	595.14	-	28.15	0.00	566.99	
B-4	593.82	26.58	26.86	0.28	567.18	
B-5	578.92	-	12.24	0.00	566.68	
B-6	575.66	-	9.14	0.00	566.52	
B-7	577.37	-	11.00	0.00	566.37	
B-8A	595.64	-	28.88	0.00	566.76	
B-8B	595.69	-	28.95	0.00	566.74	
B-9	594.23	-	27.54	0.00	566.69	

Depth in Product Storage Tank (ft):

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	4/17/98
Site Location:	LNAPL Unit	*Time In:*	900
Project Number:	97026	*Time Out:*	1030
Weather Conditions:	60 °F Overcast		

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick. (ft)	Corr. Water Table Elev.	Observations
EW-1	593.79	n/a	n/a	-	-	SitePro in Well
EW-2	593.57	-	26.47	0.00	567.10	
EW-3	593.68	-	26.51	0.00	567.17	
EW-4	582.92	-	25.66	0.00	557.26	
MW-7	594.03	26.81	27.55	0.74	567.06	
W-1	594.96	27.94	28.12	0.18	566.98	
R-1	592.94	-	25.83	0.00	567.11	
R-2	592.92	25.85	25.91	0.06	567.06	
B-1	594.98	28.09	29.05	0.96	566.68	
B-2	592.87	25.70	25.91	0.21	567.12	
B-3	595.14	28.08	28.78	0.70	566.91	
B-4	593.82	26.60	26.91	0.31	567.15	
B-5	578.92	-	12.23	0.00	566.69	
B-6	575.66	-	9.17	0.00	566.49	
B-7	577.37	-	11.09	0.00	566.28	
B-8A	595.64	-	28.96	0.00	566.68	
B-8B	595.69	-	29.05	0.00	566.64	
B-9	594.23	-	27.70	0.00	566.53	

Depth in Product Storage Tank (ft):

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	4/22/98
Site Location:	LNAPL Unit	*Time In:*	1000
Project Number:	97026	*Time Out:*	1130
Weather Conditions:	65 °F Overcast		

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick. (ft)	Corr. Water Table Elev.	Observations
EW-1	593.79	n/a	n/a	-	-	SitePro in Well
EW-2	593.57	-	26.47	0.00	567.10	
EW-3	593.68	-	26.51	0.00	567.17	
EW-4	582.92	-	25.66	0.00	557.26	
MW-7	594.03	26.81	27.55	0.74	567.06	
W-1	594.96	27.44	28.12	0.68	567.37	
R-1	592.94	-	25.83	0.00	567.11	
R-2	592.92	25.85	25.91	0.06	567.06	
B-1	594.98	28.09	29.05	0.96	566.68	
B-2	592.87	25.70	25.91	0.21	567.12	
B-3	595.14	28.08	28.78	0.70	566.91	
B-4	593.82	26.60	26.91	0.31	567.15	
B-5	578.92	-	12.23	0.00	566.69	
B-6	575.66	-	9.17	0.00	566.49	
B-7	577.37	-	11.09	0.00	566.28	
B-8A	595.64	-	28.96	0.00	566.68	
B-8B	595.69	-	29.05	0.00	566.64	
B-9	594.23	-	27.70	0.00	566.53	

Depth in Product Storage Tank (ft):

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	5/4/98
Site Location:	LNAPL Unit	*Time In:*	1540
Project Number:	97026	*Time Out:*	1630
Weather Conditions:	73 °F	Overcast	

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick. (ft)	Corr. Water Table Elev.	Observations
EW-1	593.79	n/a	n/a	0.00	-	SitePro in Well
EW-2	593.57	n/a	25.78	0.00	567.79	
EW-3	593.68	n/a	25.82	0.00	567.86	
EW-4	582.92	n/a	24.96	0.00	557.96	
MW-7	594.03	26.40	26.55	0.15	567.60	
W-1	594.96	27.27	27.40	0.13	567.66	
R-1	592.94	-	25.15	0.00	567.79	
R-2	592.92	25.19	25.25	0.06	567.72	
B-1	594.98	27.60	27.95	0.35	567.30	
B-2	592.87	25.00	25.28	0.28	567.81	
B-3	595.14	27.76	28.07	0.31	567.31	
B-4	593.82	26.07	26.31	0.24	567.70	
B-5	578.92	n/a	n/a	0.00	-	Not Measured
B-6	575.66	n/a	n/a	0.00	-	Not Measured
B-7	577.37	n/a	n/a	0.00	-	Not Measured
B-8A	595.64	-	28.35	0.00	567.29	
B-8B	595.69	-	28.38	0.00	567.31	
B-9	594.23	-	27.05	0.00	567.18	

Depth in Product Storage Tank (ft):

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	5/26/98
Site Location:	LNAPL Unit	*Time In:*	1530
Project Number:	97026	*Time Out:*	1640
Weather Conditions:	75 °F	partly cloudy	

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick. (ft)	Corr. Water Table Elev.	Observations
EW-1	593.79	n/a	n/a	0.00	-	not measured
EW-2	593.57	-	26.25	0.00	567.32	
EW-3	593.68	-	26.29	0.00	567.39	
EW-4	582.92	-	25.42	0.00	557.50	
MW-7	594.03	26.64	27.52	0.88	567.20	
W-1	594.96	27.64	27.71	0.07	567.30	
R-1	592.94	-	25.58	0.00	567.36	
R-2	592.92	25.65	25.68	0.03	567.26	
B-1	594.98	27.73	28.41	0.68	567.10	
B-2	592.87	25.48	25.80	0.32	567.32	
B-3	595.14	28.00	29.05	1.05	566.91	
B-4	593.82	26.51	26.71	0.20	567.27	
B-5	578.92	n/a	n/a	0.00	-	not measured
B-6	575.66	n/a	n/a	0.00	-	not measured
B-7	577.37	n/a	n/a	0.00	-	not measured
B-8A	595.64	-	28.84	0.00	566.80	
B-8B	595.69	-	28.85	0.00	566.84	
B-9	594.23	-	27.57	0.00	566.66	

Depth in Product Storage Tank (ft): same as before

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared B D. STOTTLEMYER **Checked By:** C.GROSE

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	6/3/98
Site Location:	LNAPL Unit	*Time In:*	1000
Project Number:	97026	*Time Out:*	1110
Weather Conditions:	75 °F partly cloudy		

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick (ft)	Corr. Water Table Elev.	Observations
EW-1	593.79	n/a	n/a	0.00	-	not measured
EW-2	593.57	-	26.46	0.00	567.11	
EW-3	593.68	-	26.50	0.00	567.18	
EW-4	582.92	-	25.65	0.00	557.27	
MW-7	594.03	26.80	27.81	1.01	567.01	
W-1	594.96	27.95	28.12	0.17	566.97	
R-1	592.94	-	25.85	0.00	567.09	
R-2	592.92	25.83	25.90	0.07	567.07	
B-1	594.98	-	28.15	0.00	566.83	
B-2	592.87	25.60	26.18	0.58	567.14	
B-3	595.14	28.03	30.20	2.17	566.63	
B-4	593.82	26.66	26.93	0.27	567.10	
B-5	578.92	-	12.31	0.00	-	
B-6	575.66	-	9.22	0.00	-	
B-7	577.37	-	11.24	0.00	-	
B-8A	595.64	-	29.07	0.00	566.57	
B-8B	595.69	-	29.14	0.00	566.55	
B-9	594.23	-	27.80	0.00	566.43	

Depth in Product Storage Tank (ft): same as before

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared B D. STOTTLEMYER **Checked By:** C.GROSE

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	6/25/98
Site Location:	LNAPL Unit	*Time In:*	1200
Project Number:	97026	*Time Out:*	1310
Weather Conditions:	92 °F		

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick. (ft)	Corr. Water Table Elev.	Observations
EW-1	593.79	n/a	n/a	0.00	-	not measured
EW-2	593.57	-	26.37	0.00	567.20	
EW-3	593.68	-	26.41	0.00	567.27	
EW-4	582.92	-	26.51	0.00	556.41	
MW-7	594.03	26.75	27.39	0.64	567.14	
W-1	594.96	27.80	28.01	0.21	567.11	
R-1	592.94	-	25.73	0.00	567.21	
R-2	592.92	25.71	25.85	0.14	567.18	
B-1	594.98	28.21	29.89	1.68	566.40	
B-2	592.87	24.45	26.15	1.70	568.05	
B-3	595.14	28.10	28.62	0.52	566.93	
B-4	593.82	26.55	26.80	0.25	567.22	
B-5	578.92	-	12.18	0.00	566.74	
B-6	575.66	-	9.17	0.00	566.49	
B-7	577.37	-	11.15	0.00	566.22	
B-8A	595.64	-	28.99	0.00	566.65	
B-8B	595.69	-	29.07	0.00	566.62	
B-9	594.23	-	27.68	0.00	566.55	

Depth in Product Storage Tank (ft):

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	7/8/98
Site Location:	LNAPL Unit	*Time In:*	1520
Project Number:	97026	*Time Out:*	1620
Weather Conditions:	80 °F		

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick. (ft)	Corr. Water Table Elev.	Observations
EW-1	593.79	n/a	n/a	0.00	-	not measured
EW-2	593.57	-	26.37	0.00	567.20	
EW-3	593.68	-	26.40	0.00	567.28	
EW-4	582.92	-	25.53	0.00	557.39	
MW-7	594.03	26.71	27.80	1.09	567.08	
W-1	594.96	27.85	28.02	0.17	567.07	
R-1	592.94	-	25.72	0.00	567.22	
R-2	592.92	25.75	25.86	0.11	567.15	
B-1	594.98	27.76	28.80	1.04	566.99	
B-2	592.87	25.44	26.18	0.74	567.27	
B-3	595.14	27.77	28.91	1.14	567.12	
B-4	593.82	26.60	26.82	0.22	567.17	
B-5	578.92	-	12.18	0.00	566.74	
B-6	575.66	-	9.17	0.00	566.49	
B-7	577.37	-	11.12	0.00	566.25	
B-8A	595.64	-	29.01	0.00	566.63	
B-8B	595.69	-	29.09	0.00	566.60	
B-9	594.23	-	27.74	0.00	566.49	

Depth in Product Storage Tank (ft):

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	7/17/98
Site Location:	LNAPL Unit	*Time In:*	1055
Project Number:	97026	*Time Out:*	1150
Weather Conditions:	80 °F		

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick. (ft)	Corr. Water Table Elev.	Observations
EW-1	593.79	n/a	n/a	0.00	-	not measured
EW-2	593.57	-	26.50	0.00	567.07	
EW-3	593.68	-	26.54	0.00	567.14	
EW-4	582.92	-	25.66	0.00	557.26	
MW-7	594.03	26.80	28.26	1.46	566.91	
W-1	594.96	27.98	28.17	0.19	566.94	
R-1	592.94	-	25.87	0.00	567.07	
R-2	592.92	25.89	25.99	0.10	567.01	
B-1	594.98	27.85	29.20	1.35	566.83	
B-2	592.87	25.60	26.45	0.85	567.08	
B-3	595.14	27.80	29.51	1.71	566.96	
B-4	593.82	26.75	27.03	0.28	567.01	
B-5	578.92	-	12.31	0.00	566.61	
B-6	575.66	-	9.27	0.00	566.39	
B-7	577.37	-	11.26	0.00	566.11	
B-8A	595.64	-	29.15	0.00	566.49	
B-8B	595.69	-	29.21	0.00	566.48	
B-9	594.23	-	27.87	0.00	566.36	

Depth in Product Storage Tank (ft):

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	8/11/98
Site Location:	LNAPL Unit	*Time In:*	1330
Project Number:	97026	*Time Out:*	1430
Weather Conditions:	80 °F		

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick (ft)	Corr Water Table Elev	Observations
EW-1	593.79	n/a	n/a	0.00	-	not measured
EW-2	593.57	-	26.56	0.00	567.01	
EW-3	593.68	-	26.60	0.00	567.08	
EW-4	582.92	-	25.74	0.00	557.18	
MW-7	594.03	26.84	28.42	1.58	566.84	
W-1	594.96	28.04	28.22	0.18	566.88	
R-1	592.94	-	25.90	0.00	567.04	
R-2	592.92	25.87	26.39	0.52	566.94	
B-1	594.98	28.88	29.43	0.55	565.98	
B-2	592.87	25.65	26.69	1.04	566.99	
B-3	595.14	27.84	29.64	1.80	566.90	
B-4	593.82	26.82	27.81	0.99	566.78	
B-5	578.92	-	12.38	0.00	566.54	
B-6	575.66	-	9.34	0.00	566.32	
B-7	577.37	-	11.31	0.00	566.06	
B-8A	595.64	-	29.20	0.00	566.44	
B-8B	595.69	-	29.25	0.00	566.44	
B-9	594.23	-	27.91	0.00	566.32	

Depth in Product Storage Tank (ft): __________

Comments: __________

Equipment and/or Services Needed During Next Monitoring Visit: __________

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	8/17/98
Site Location:	LNAPL Unit	*Time In:*	1100
Project Number:	97026	*Time Out:*	1200
Weather Conditions:	80 °F		

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick. (ft)	Corr. Water Table Elev.	Observations
EW-1	593.79	n/a	n/a	0.00	-	not measured
EW-2	593.57	-	26.62	0.00	566.95	
EW-3	593.68	-	26.67	0.00	567.01	
EW-4	582.92	-	25.80	0.00	557.12	
MW-7	594.03	26.84	28.50	1.66	566.82	
W-1	594.96	28.11	28.32	0.21	566.80	
R-1	592.94	-	25.99	0.00	566.95	
R-2	592.92	25.94	26.41	0.47	566.88	
B-1	594.98	27.87	29.46	1.59	566.76	
B-2	592.87	25.65	26.71	1.06	566.99	
B-3	595.14	27.85	29.56	1.71	566.91	
B-4	593.82	26.81	27.11	0.30	566.94	
B-5	578.92	-	12.37	0.00	566.55	
B-6	575.66	-	9.32	0.00	566.34	
B-7	577.37	-	11.29	0.00	566.08	
B-8A	595.64	-	29.27	0.00	566.37	
B-8B	595.69	-	29.38	0.00	566.31	
B-9	594.23	-	28.04	0.00	566.19	

Depth in Product Storage Tank (ft):

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	8/25/98
Site Location:	LNAPL Unit	*Time In:*	1400
Project Number:	97026	*Time Out:*	1500
Weather Conditions:	89 °F		

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick (ft)	Corr. Water Table Elev.	Observations
EW-1	593.79	n/a	n/a	0.00	-	not measured
EW-2	593.57	-	26.47	0.00	567.10	
EW-3	593.68	-	26.51	0.00	567.17	
EW-4	582.92	-	25.65	0.00	557.27	
MW-7	594.03	26.78	28.40	1.62	566.89	
W-1	594.96	27.96	28.12	0.16	566.96	
R-1	592.94	-	25.84	0.00	567.10	
R-2	592.92	25.77	26.37	0.60	567.02	
B-1	594.98	27.81	29.40	1.59	566.82	
B-2	592.87	25.60	26.58	0.98	567.05	
B-3	595.14	27.80	29.65	1.85	566.93	
B-4	593.82	26.77	27.07	0.30	566.98	
B-5	578.92	-	12.31	0.00	566.61	
B-6	575.66	-	9.27	0.00	566.39	
B-7	577.37	-	11.26	0.00	566.11	
B-8A	595.64	-	29.13	0.00	566.51	
B-8B	595.69	-	29.20	0.00	566.49	
B-9	594.23	-	27.82	0.00	566.41	

Depth in Product Storage Tank (ft):

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	9/8/98
Site Location:	LNAPL Unit	*Time In:*	1400
Project Number:	97026	*Time Out:*	1500
Weather Conditions:	70 °F		

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick. (ft)	Corr. Water Table Elev.	Observations
EW-1	593.79	n/a	-	0.00	-	not measured
EW-2	593.57	-	26.51	0.00	567.06	
EW-3	593.68	-	26.57	0.00	567.11	
EW-4	582.92	-	25.70	0.00	557.22	
MW-7	594.03	26.80	28.49	1.69	566.86	
W-1	594.96	28.00	28.18	0.18	566.92	
R-1	592.94	-	25.89	0.00	567.05	
R-2	592.92	25.78	26.61	0.83	566.96	
B-1	594.98	27.82	29.49	1.67	566.79	
B-2	592.87	25.61	26.66	1.05	567.03	
B-3	595.14	27.82	29.67	1.85	566.91	
B-4	593.82	26.78	27.12	0.34	566.97	
B-5	578.92	-	12.30	0.00	566.62	
B-6	575.66	-	9.25	0.00	566.41	
B-7	577.37	-	11.22	0.00	566.15	
B-8A	595.64	-	29.15	0.00	566.49	
B-8B	595.69	-	29.17	0.00	566.52	
B-9	594.23	-	27.86	0.00	566.37	

Depth in Product Storage Tank (ft):

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	9/14/98
Site Location:	LNAPL Unit	*Time In:*	1445
Project Number:	97026	*Time Out:*	1600
Weather Conditions:	85 °F		

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick. (ft)	Corr. Water Table Elev.	Observations
EW-1	593.79	n/a	-	0.00	-	not measured
EW-2	593.57	-	26.56	0.00	567.01	
EW-3	593.68	-	26.61	0.00	567.07	
EW-4	582.92	-	25.75	0.00	557.17	
MW-7	594.03	26.81	28.58	1.77	566.83	
W-1	594.96	28.02	28.20	0.18	566.90	
R-1	592.94	-	25.92	0.00	567.02	
R-2	592.92	25.78	26.74	0.96	566.93	
B-1	594.98	27.86	29.56	1.70	566.75	
B-2	592.87	25.61	26.69	1.08	567.02	
B-3	595.14	27.82	29.81	1.99	566.88	
B-4	593.82	26.81	27.18	0.37	566.93	
B-5	578.92	-	12.37	0.00	566.55	
B-6	575.66	-	9.32	0.00	566.34	
B-7	577.37	-	11.31	0.00	566.06	
B-8A	595.64	-	29.17	0.00	566.47	
B-8B	595.69	-	29.25	0.00	566.44	
B-9	594.23	-	27.87	0.00	566.36	

Depth in Product Storage Tank (ft):

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	12/4/98
Site Location:	LNAPL Unit	*Time In:*	1330
Project Number:	97026	*Time Out:*	1500
Weather Conditions:	65 °F		

Well #	Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thick. (ft)	Corr. Water Table Elev.	Observations
EW-1	593.79	n/a	-	0.00	-	not measured
EW-2	593.57	-	26.59	0.00	566.98	
EW-3	593.68	-	26.61	0.00	567.07	
EW-4	582.92	-	25.80	0.00	557.12	
MW-7	594.03	26.82	28.76	1.94	566.78	
W-1	594.96	-	28.06	0.00	566.90	
R-1	592.94	-	25.98	0.00	566.96	
R-2	592.92	25.70	27.22	1.52	566.89	
B-1	594.98	27.85	29.72	1.87	566.72	
B-2	592.87	25.66	26.78	1.12	566.96	
B-3	595.14	27.86	29.94	2.08	566.82	
B-4	593.82	26.62	28.15	1.53	566.86	
B-5	578.92	-	12.32	0.00	566.60	
B-6	575.66	-	9.26	0.00	566.40	
B-7	577.37	-	11.21	0.00	566.16	
B-8A	595.64	-	29.17	0.00	566.47	
B-8B	595.69	-	29.19	0.00	566.50	
B-9	594.23	-	27.85	0.00	566.38	

Depth in Product Storage Tank (ft):

Comments:

Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

MONITORING WELL LOG

Client:	Solutia, Inc.	*Date:*	12/22/98
Site Location:	LNAPL Unit	*Time In:*	1008
Project Number:	97026	*Time Out:*	1110
Weather Conditions:	28 °F		

EW-1	593.79	26.70	27.85	1.15	566.84	
EW-2	593.57	-	26.67	0.00	566.90	
EW-3	593.68	-	26.74	0.00	566.94	
EW-4	582.92	-	25.91	0.00	557.01	
MW-7	594.03	26.85	28.77	1.82	566.76	
W-1	594.96	28.14	28.33	0.19	566.78	
R-1	592.94	-	26.08	0.00	566.86	
R-2	592.92	25.82	27.31	1.49	566.77	
B-1	594.98	27.85	29.70	1.85	566.72	
B-2	592.87	25.77	27.02	1.25	566.83	
B-3	595.14	27.87	29.89	2.02	566.83	
B-4	593.82	26.61	28.28	1.67	566.84	
B-5	578.92	-	12.37	0.00	566.55	
B-6	575.66	-	9.26	0.00	566.40	
B-7	577.37	-	11.21	0.00	566.16	
B-8A	595.64	n/a	n/a	n/a	n/a	not measured
B-8B	595.69	n/a	n/a	n/a	n/a	not measured
B-9	594.23	n/a	n/a	n/a	n/a	not measured

Depth in Product Storage Tank (ft):

Comments:

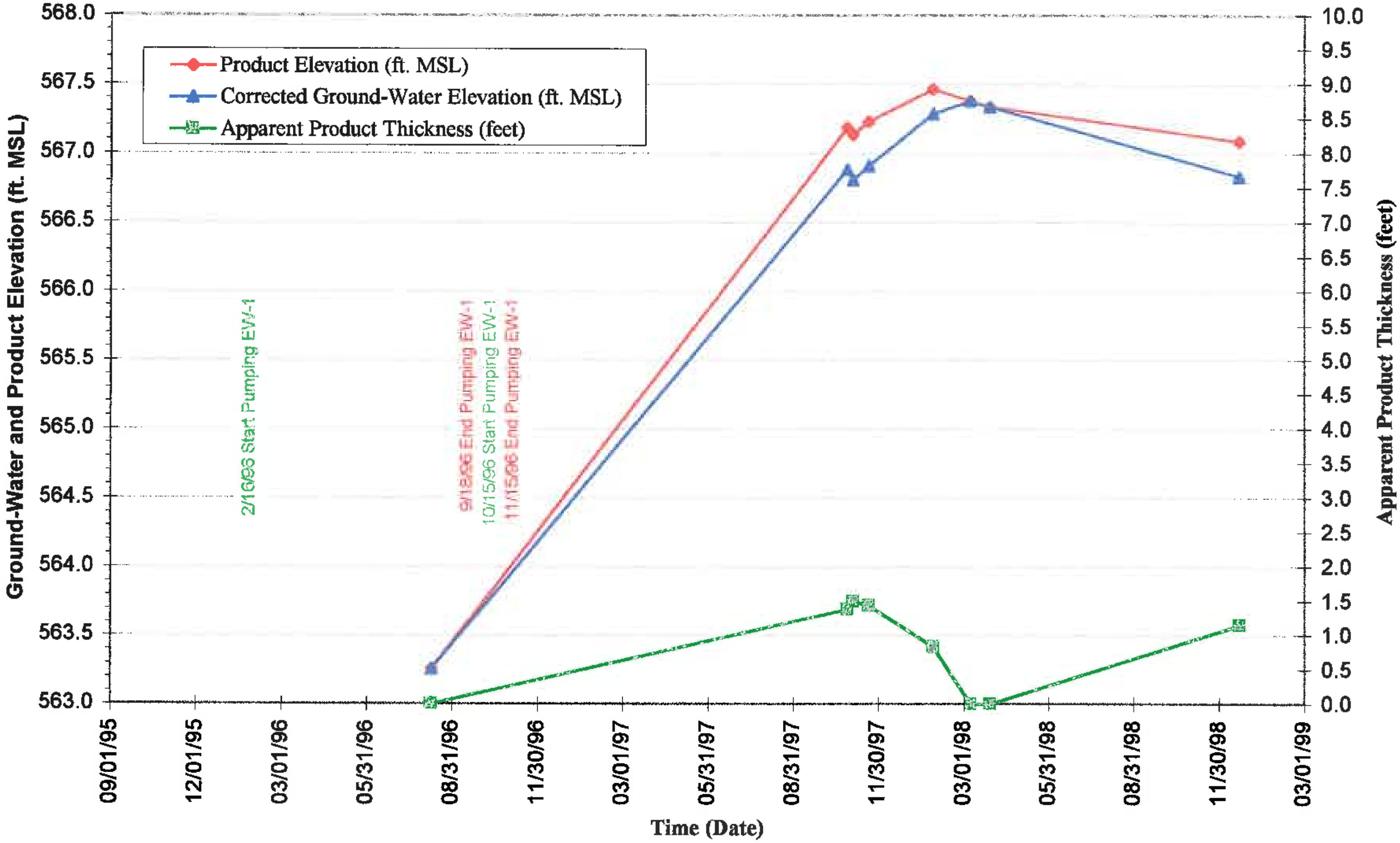
Equipment and/or Services Needed During Next Monitoring Visit:

Prepared By: **Checked By:**

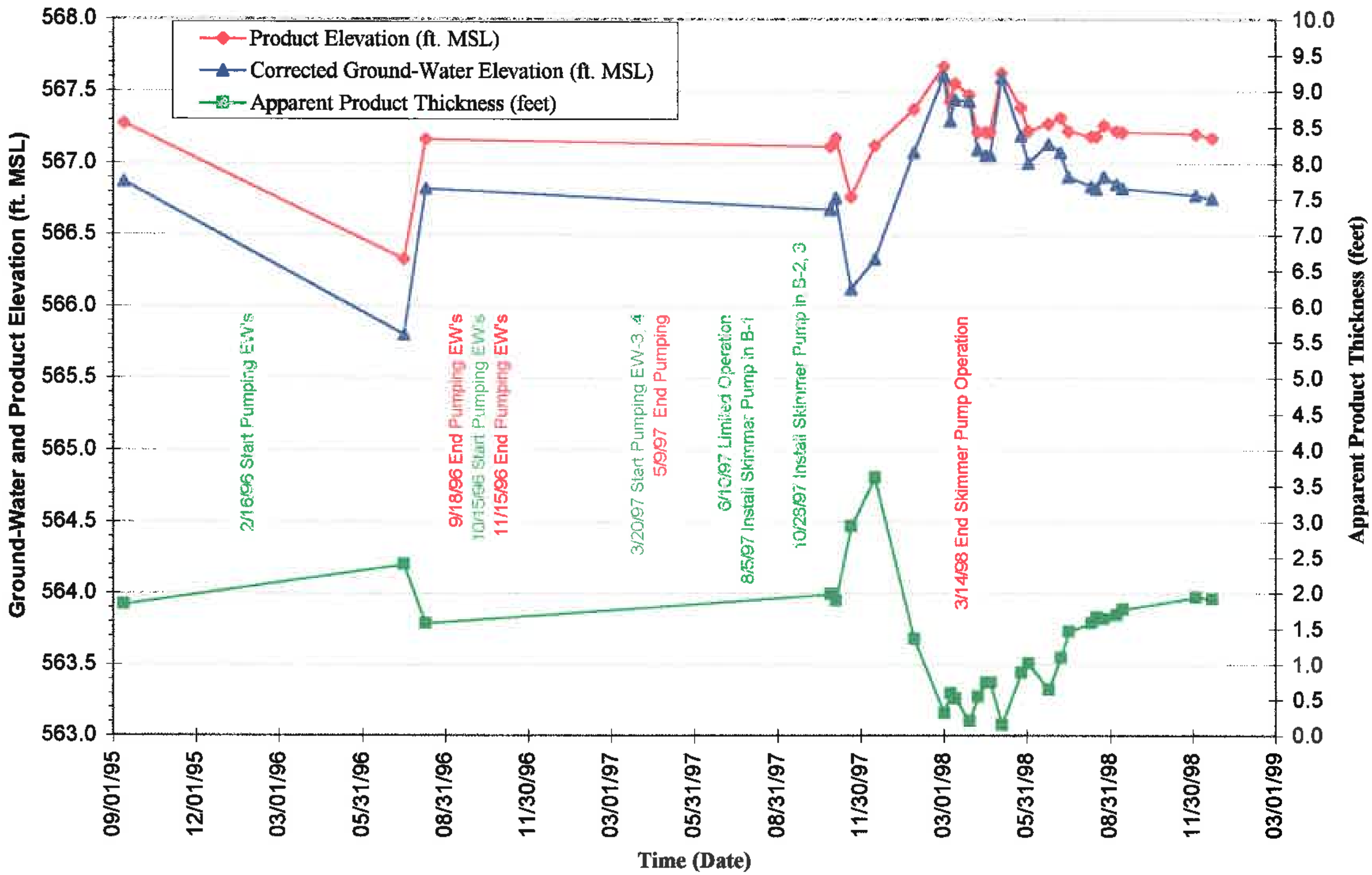
APPENDIX D

PAST DISPOSAL AREA
LNAPL PRODUCT THICKNESS TRENDS

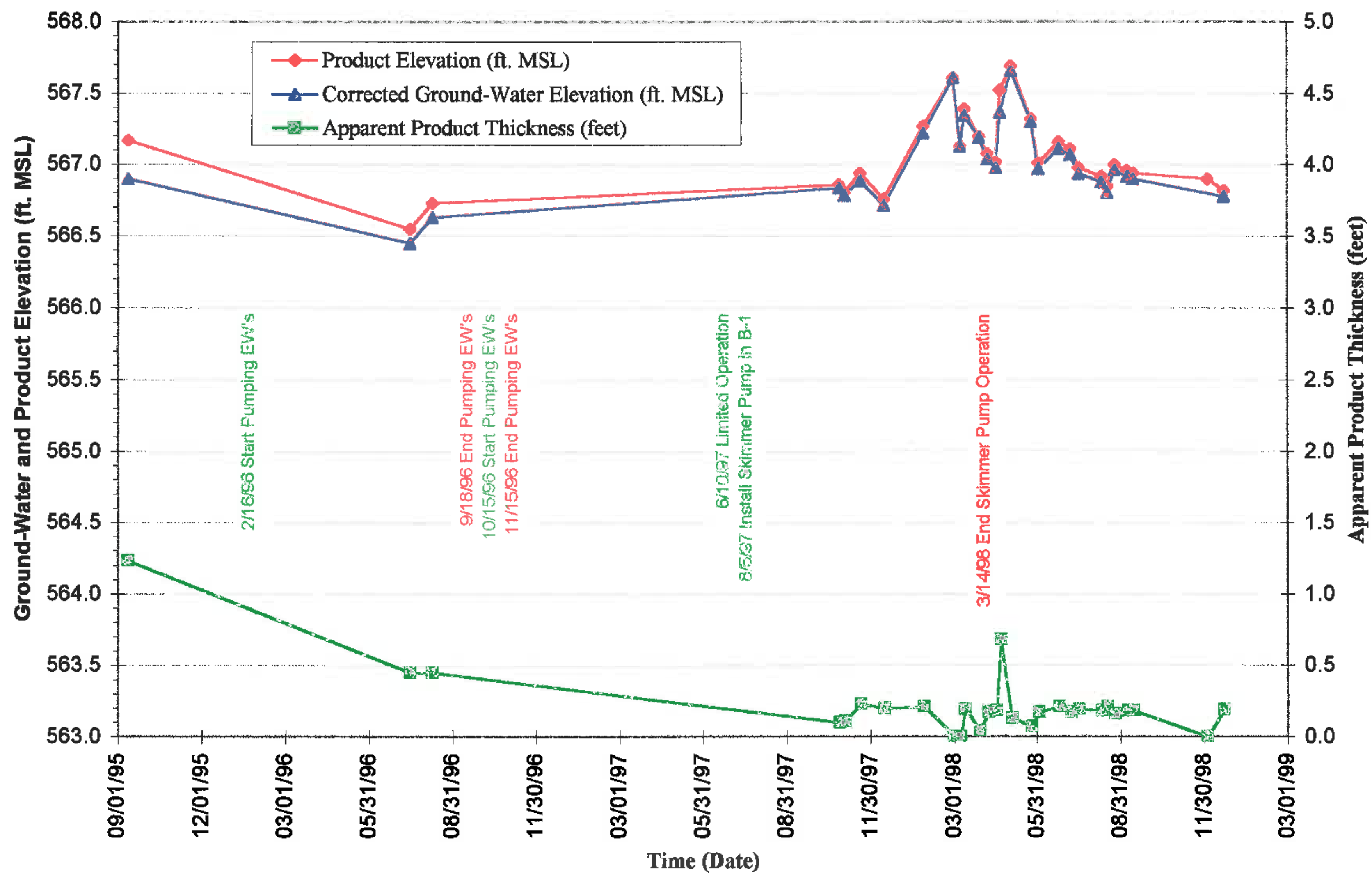
LNAPL Well # EW-1 Corrected Ground-Water Elevation, Product Elevation and Apparent Product Thickness vs. Time



LNAPL Well # MW-7 Corrected Ground-Water Elevation, Product Elevation and Apparent Product Thickness vs. Time



LNAPL Well # W-1 Corrected Ground-Water Elevation, Product Elevation and Apparent Product Thickness vs. Time



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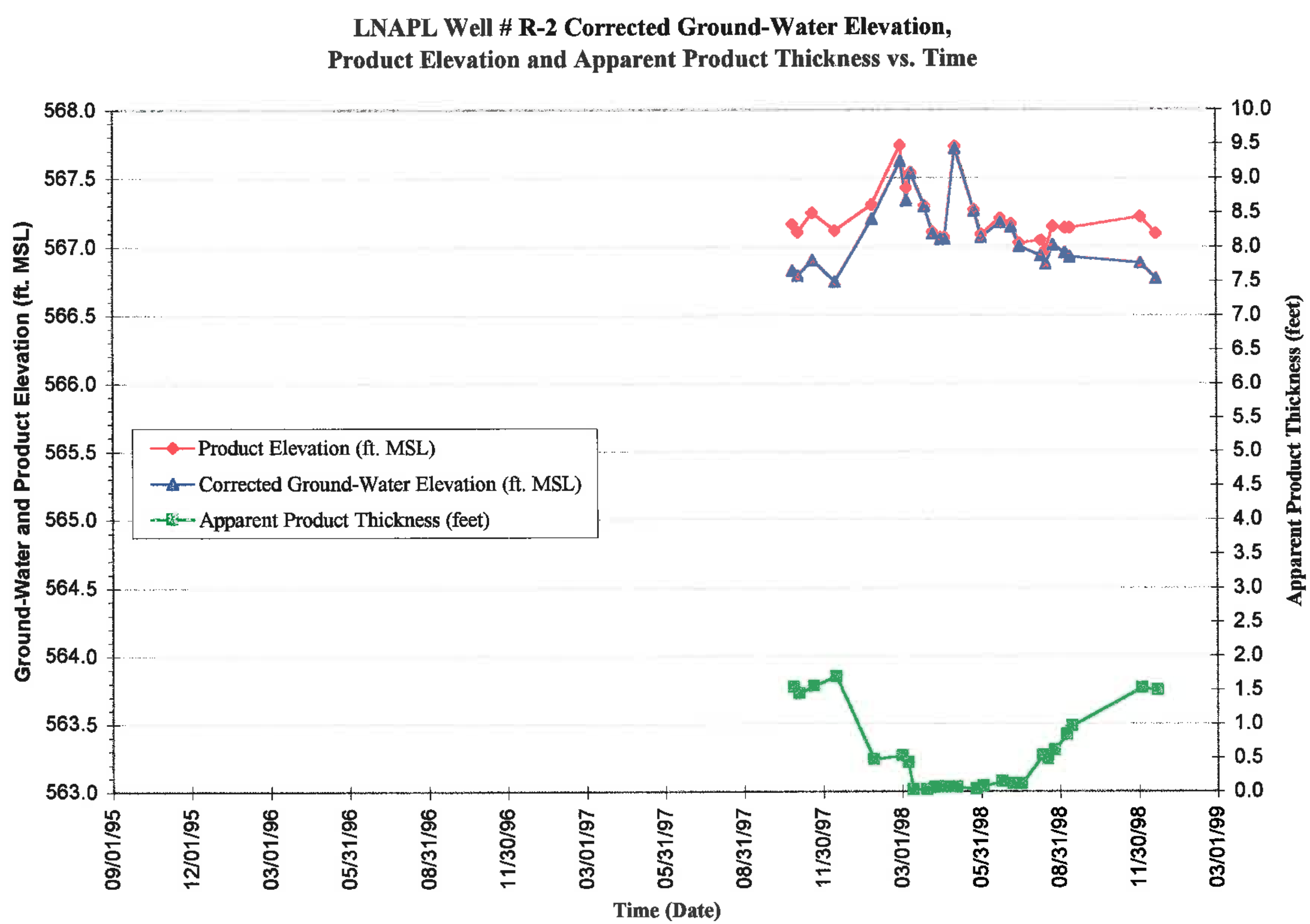

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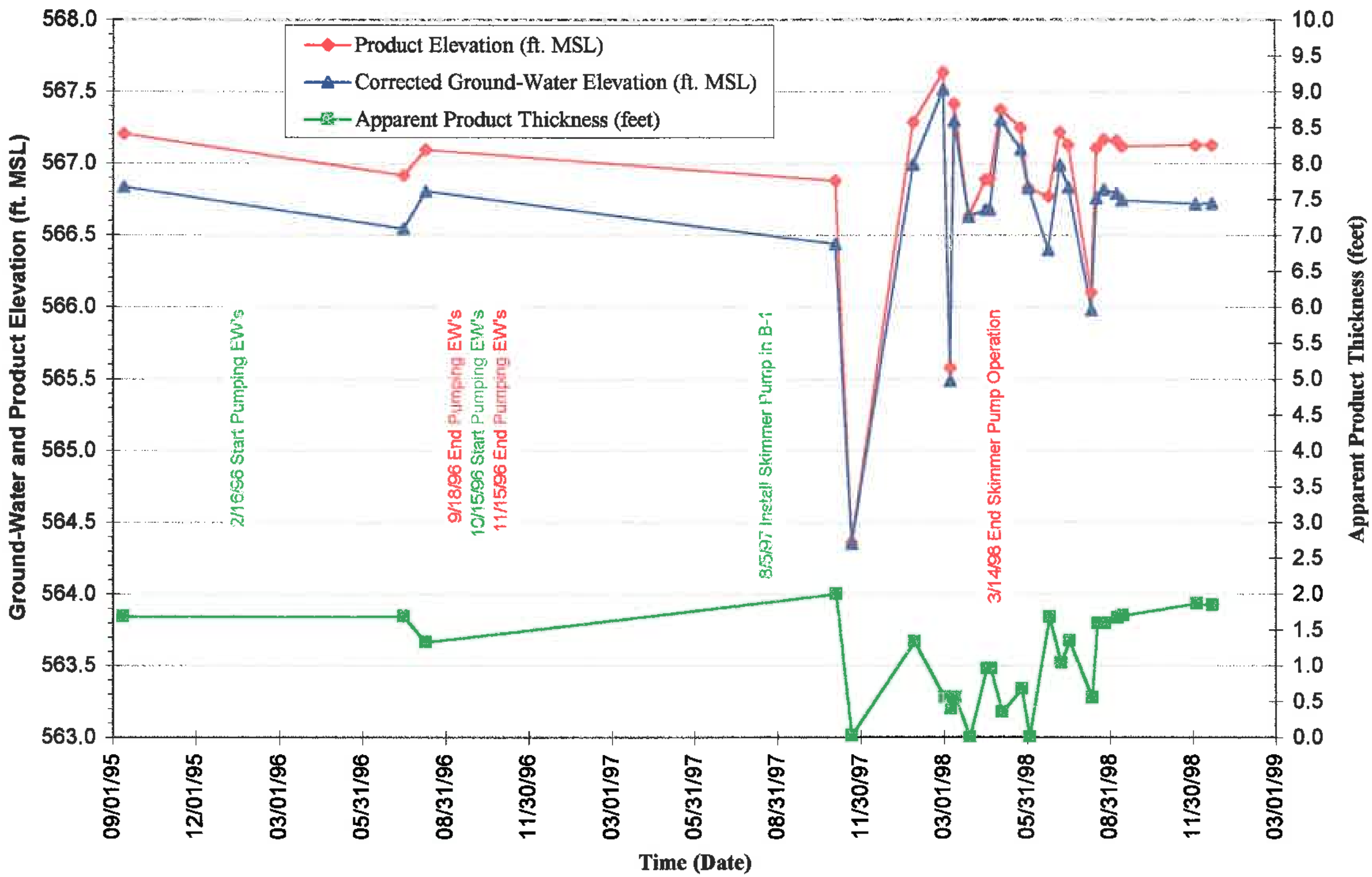
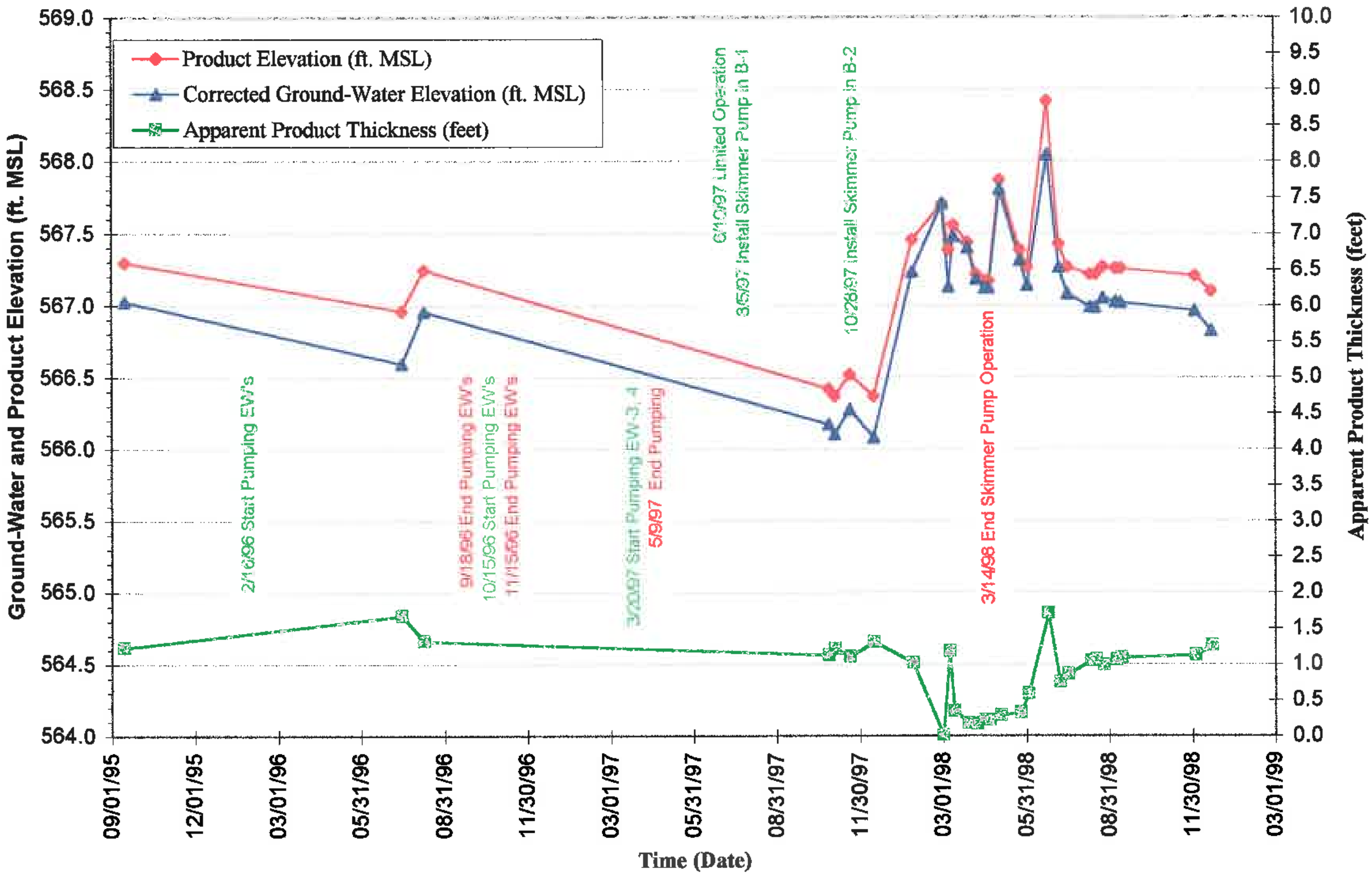
LNAPL Well # B-1 Corrected Ground-Water Elevation, Product Elevation and Apparent Product Thickness vs. Time



LNAPL Well # B-2 Corrected Ground-Water Elevation, Product Elevation and Apparent Product Thickness vs. Time



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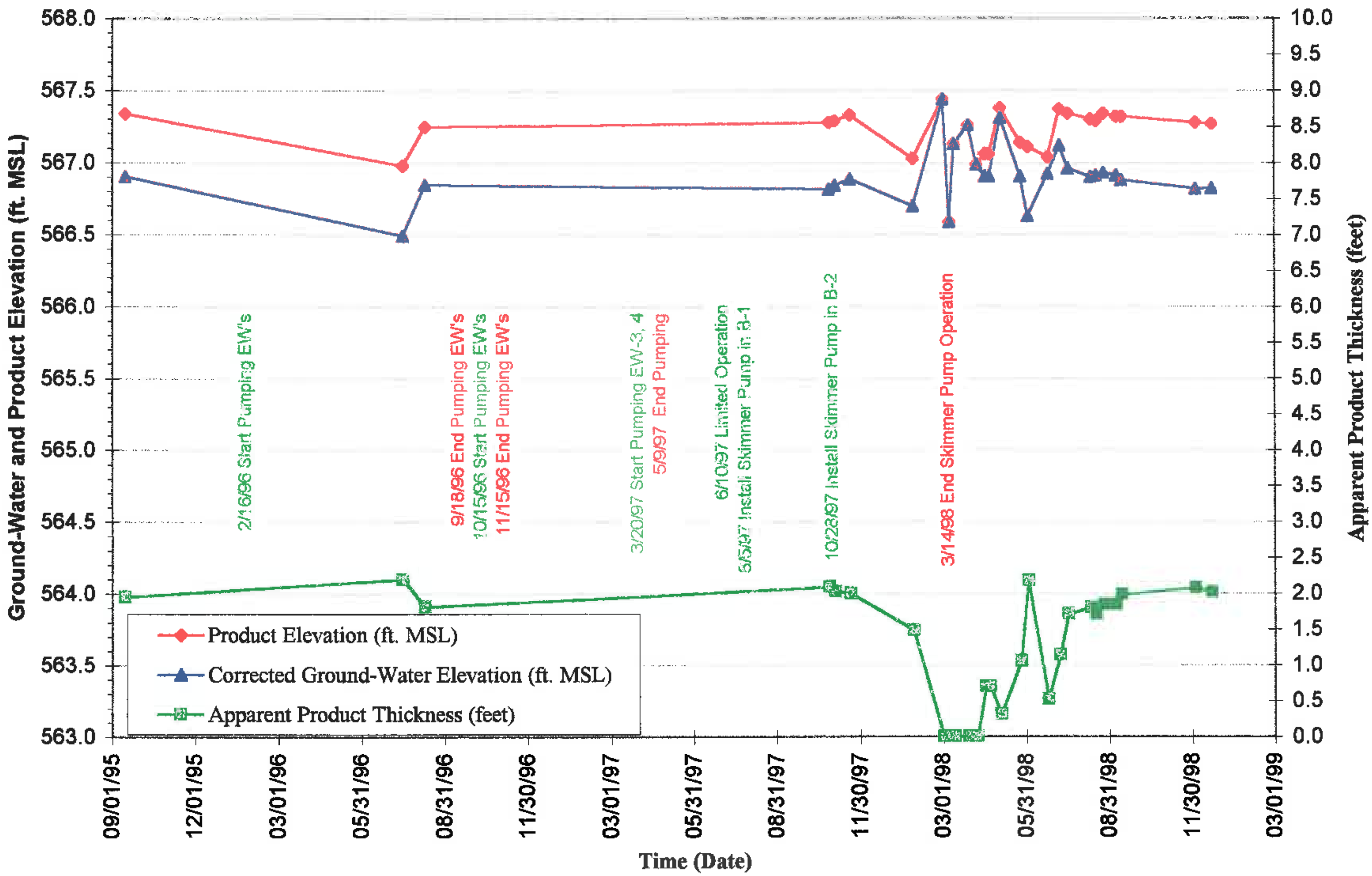
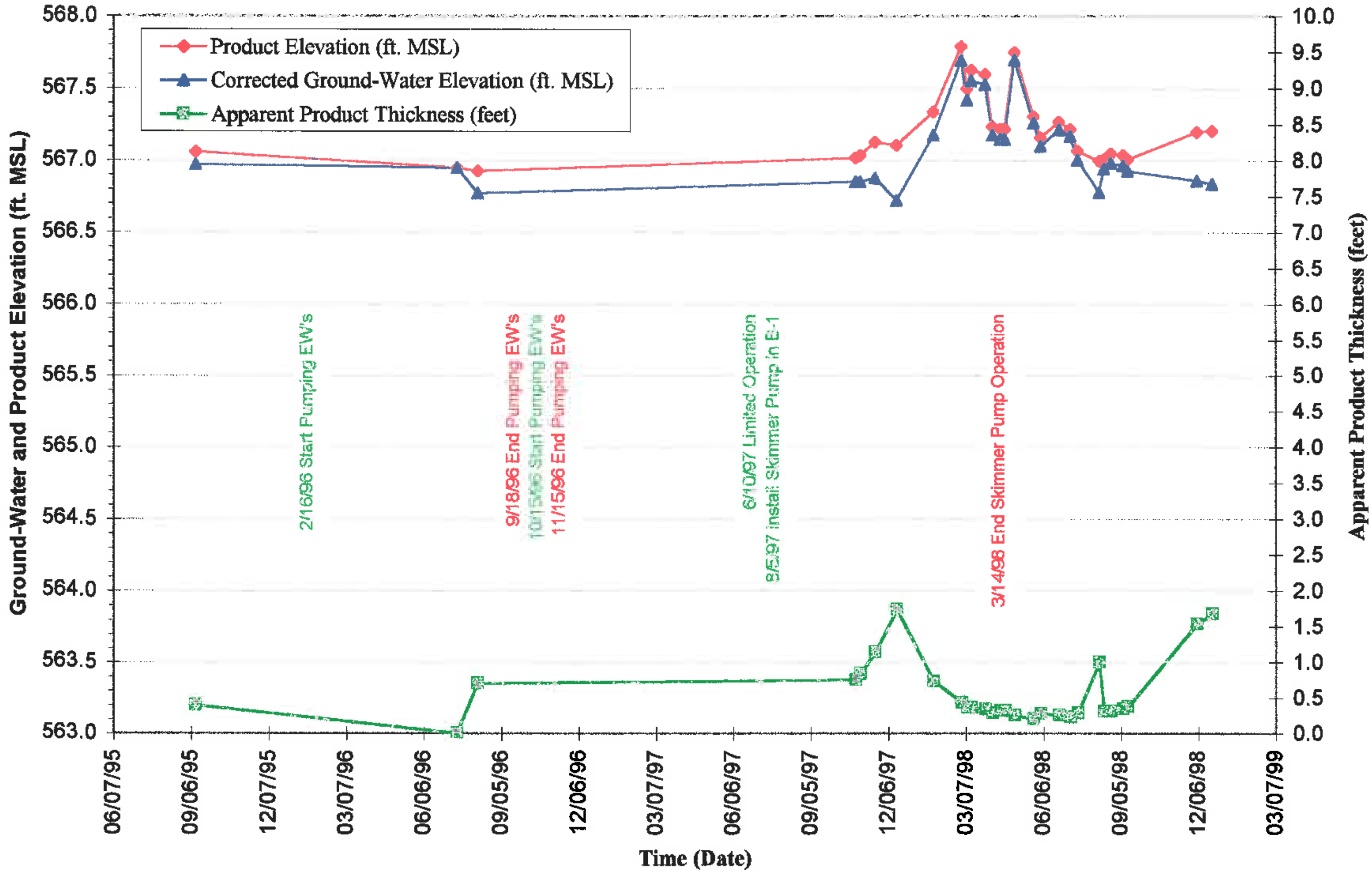
LNAPL Well B-3 Corrected Ground-Water Elevation, Product Elevation and Apparent Product Thickness vs. Time



LNAPL Well # B-4 Corrected Ground-Water Elevation, Product Elevation and Apparent Product Thickness vs. Time



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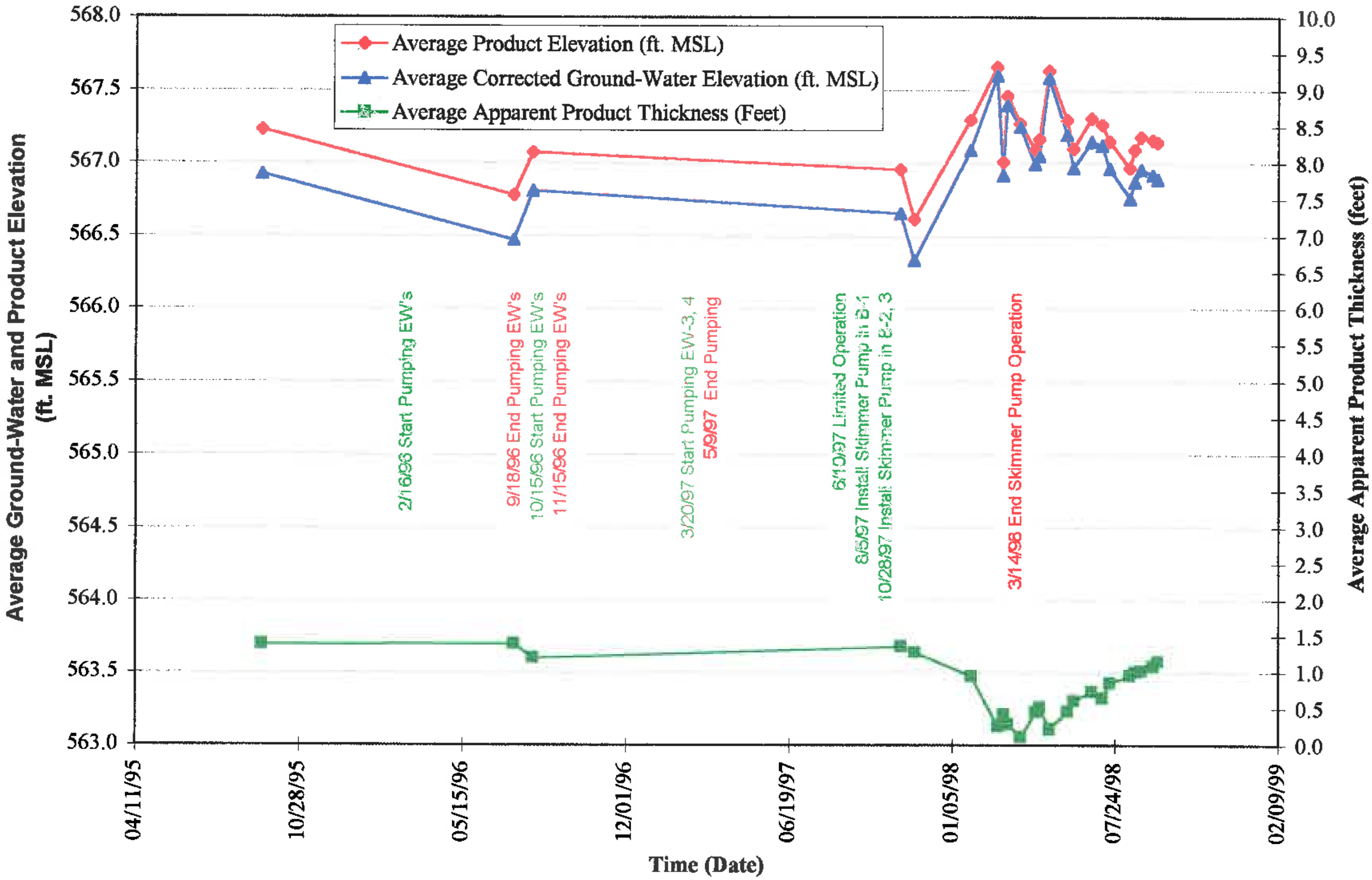
LNAPL Area Average Corrected Groundwater Elevation, Average Product Elevation and Average Apparent Product Thickness vs. Time



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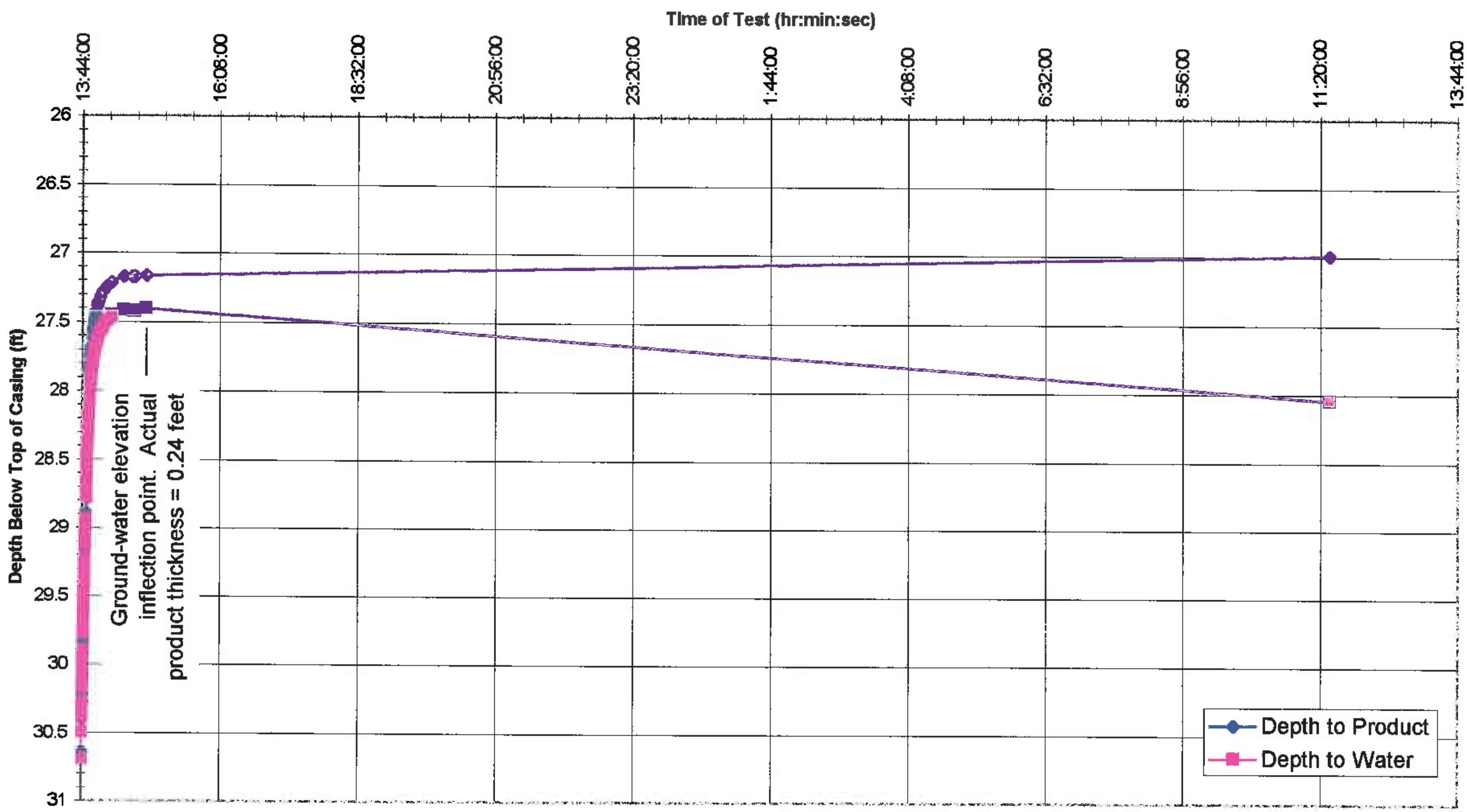
APPENDIX E

PAST DISPOSAL AREA
PRODUCT BAIL-DOWN TEST RESULTS

LNAPL Recovery Area
Well MW-7 Baildown Test Results



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Well MW-7 Product Bail-Down Test Results

	Time	Depth to Product	Depth to Water	Product Thickness
13:44:00	13:44:00	30.64	30.69	0.05
0:00:14	13:44:14	30.4	30.49	0.09
0:00:30	13:44:30	30.28	30.39	0.11
0:00:40	13:44:40	30.21	30.34	0.13
0:00:45	13:44:45	30.14	30.27	0.13
0:00:50	13:44:50	30.06	30.17	0.11
0:01:00	13:45:00	30	30.12	0.12
0:01:05	13:45:05	29.9	30.04	0.14
0:01:20	13:45:20	29.83	29.96	0.13
0:01:30	13:45:30	29.74	29.9	0.16
0:01:40	13:45:40	29.65	29.78	0.13
0:01:50	13:45:50	29.57	29.7	0.13
0:01:55	13:45:55	29.5	29.64	0.14
0:02:00	13:46:00	29.42	29.57	0.15
0:02:20	13:46:20	29.31	29.5	0.19
0:02:30	13:46:30	29.23	29.46	0.23
0:02:40	13:46:40	29.16	29.41	0.25
0:02:50	13:46:50	29.1	29.33	0.23
0:03:00	13:47:00	29.02	29.24	0.22
0:03:15	13:47:15	28.94	29.14	0.2
0:03:20	13:47:20	28.88	29.1	0.22
0:03:35	13:47:35	28.79	29.02	0.23
0:03:50	13:47:50	28.71	28.98	0.27
0:04:00	13:48:00	28.64	28.93	0.29
0:04:20	13:48:20	28.55	28.78	0.23
0:04:25	13:48:25	28.5	28.71	0.21
0:04:40	13:48:40	28.45	28.67	0.22
0:04:50	13:48:50	28.4	28.58	0.18
0:05:00	13:49:00	28.34	28.53	0.19
0:05:10	13:49:10	28.28	28.51	0.23
0:05:20	13:49:20	28.25	28.47	0.22
0:05:30	13:49:30	28.2	28.4	0.2
0:05:45	13:49:45	28.15	28.36	0.21
0:05:55	13:49:55	28.1	28.31	0.21
0:06:10	13:50:10	28.04	28.28	0.24
0:06:20	13:50:20	28.01	28.22	0.21
0:06:35	13:50:35	27.96	28.17	0.21
0:06:50	13:50:50	27.91	28.14	0.23
0:07:00	13:51:00	27.88	28.12	0.24
0:07:20	13:51:20	27.83	28.07	0.24
0:07:35	13:51:35	27.8	28.05	0.25
0:07:55	13:51:55	27.75	28	0.25
0:08:15	13:52:15	27.73	27.97	0.24
0:08:30	13:52:30	27.7	27.95	0.25
0:08:50	13:52:50	27.67	27.92	0.25
0:09:40	13:53:40	27.61	27.84	0.23
0:10:15	13:54:15	27.58	27.81	0.23
0:10:50	13:54:50	27.55	27.79	0.24
0:11:20	13:55:20	27.53	27.78	0.25
0:11:50	13:55:50	27.5	27.74	0.24
0:12:20	13:56:20	27.48	27.72	0.24

Well MW-7 Product Bail-Down Test Results

	Time	Depth to Product	Depth to Water	Product Thickness
0:13:10	13:57:10	27.45	27.69	0.24
0:14:00	13:58:00	27.42	27.66	0.24
0:15:30	13:59:30	27.38	27.63	0.25
0:16:30	14:00:30	27.36	27.59	0.23
0:16:55	14:00:55	27.35	27.59	0.24
0:19:00	14:03:00	27.31	27.56	0.25
0:21:20	14:05:20	27.28	27.54	0.26
0:22:40	14:06:40	27.27	27.51	0.24
0:25:45	14:09:45	27.24	27.49	0.25
0:30:10	14:14:10	27.21	27.45	0.24
0:43:20	14:27:20	27.17	27.41	0.24
0:52:20	14:36:20	27.17	27.42	0.25
0:55:20	14:39:20	27.17	27.42	0.25
1:06:50	14:50:50	27.16	27.4	0.24
21:46:00	35:30:00	26.99	28.04	1.05

Client:	SOLUTIA, INC.	**Date:**	12-29-98
Facility:	LNAPL UNIT	**Project No.:**	97026
	SOLUTIA, INC.	**Field Staff:**	D. STOTTLEMYER / C. GROSE
	NITRO, WV.	**Test Well:**	MW-7

SUMMARY OF TEST DATA - BAILOUT TEST

MW DATA:

Test Well I.D. MW-7 Diameter of MW: 2" PVC

Initial DTW (ft): 28.45, Date/Time: 12-29-98/1330

Initial Depth to Product (ft): 26.81

Equipment Used for Measurement: INTERPHASE PROBE

EVACUATION SUMMARY:

Total Volume Fluid Removed: 2.4 gallons;

Vol. Product Removed 1.5 gallons; Vol. Water Removed: 0.9 gallons

Evacuation Method: BAILER

LEGEND:

Drawdown (H) = DTW_t - DTW_o; DTW = Depth to Water; DTP = Depth to Product

** Continue Recharge Measurements until H/H_o = 0.37

Measurement	(Time) - Elapsed Time	DTP (ft)	DTW (ft)	Drawdown (H) (ft)	H/Ho
1	(1344) 0	30.64	30.69	H_o = 2.24	1.0
2	0'14"	30.40	30.49	2.04	0.911
3	0'30"	30.28	30.39	1.94	0.866
4	0'40"	30.21	30.34	1.89	0.844
5	0'45"	30.14	30.27	1.82	0.813
6	0'50"	30.06	30.17	1.72	0.768
7	1'00"	30.00	30.12	1.67	0.746
8	1'05"	29.90	30.04	1.59	0.710
9	1'20"	29.83	29.96	1.51	0.674
10	1'30"	29.74	29.90	1.45	0.647
11	1'40"	29.65	29.78	1.33	0.594
12	1'50"	29.57	29.70	1.25	0.558
13	1'55"	29.50	29.64	1.19	0.531
14	2'00"	29.42	29.57	1.12	0.500
15	2'20"	29.31	29.50	1.05	0.469
16	2'30"	29.23	29.46	1.01	0.451

Measurement	(Time) - Elapsed Time	DTP (ft)	DTW (ft)	Drawdown (H) (ft)	H/Ho
17	2'40"	29.16	29.41	0.96	0.429
18	2'50"	29.10	29.33	0.88	0.393
19	3'00"	29.02	29.24	0.79	0.353
20	3'15"	28.94	29.14	0.69	0.308
21	3'20"	28.88	29.10	0.65	0.290
22	3'35"	28.79	29.02	0.57	0.254
23	3'50"	28.71	28.98	0.53	0.237
24	4'00"	28.64	28.93	0.48	0.214
25	4'20"	28.55	28.78	0.33	0.147
26	4'25"	28.50	28.71	0.26	0.116
27	4'40"	28.45	28.67	0.22	0.098
28	4'50"	28.40	28.58	0.13	0.058
29	5'00"	28.34	28.53	0.08	0.036
30	5'10"	28.28	28.51	0.06	0.027
31	5'20"	28.25	28.47	0.02	0.009
32	5'30"	28.20	28.40	-0.05	-0.022
33	5'45"	28.15	28.36	-0.09	-0.040
34	5'55"	28.10	28.31	-0.14	-0.063
35	6'10"	28.04	28.28	-0.17	-0.076
36	6'20"	28.01	28.22	-0.23	-0.103
37	6'35"	27.96	28.17	-0.27	-0.121
38	6'50"	27.91	28.14	-0.31	-0.138
39	7'00"	27.88	28.12	-0.33	-0.147
40	7'20"	27.83	28.07	-0.38	-0.170
41	7'35"	27.80	28.05	-0.40	-0.179
42	7'55"	27.75	28.00	-0.45	-0.201
43	8'15"	27.73	27.97	-0.48	-0.214
44	8'30"	27.70	27.95	-0.50	-0.223
45	8'50"	27.67	27.92	-0.53	-0.237
46	9'40"	27.61	27.84	-0.61	-0.272
47	10'15"	27.58	27.81	-0.64	-0.286
48	10'50"	27.55	27.79	-0.66	-0.295
49	11'20"	27.53	27.78	-0.67	

Potesta & Associates, Inc.
2300 MacCorkle Ave. SE
Charleston, WV 25304 Phone: (304) 342-1400, Fax: (304) 343-9031

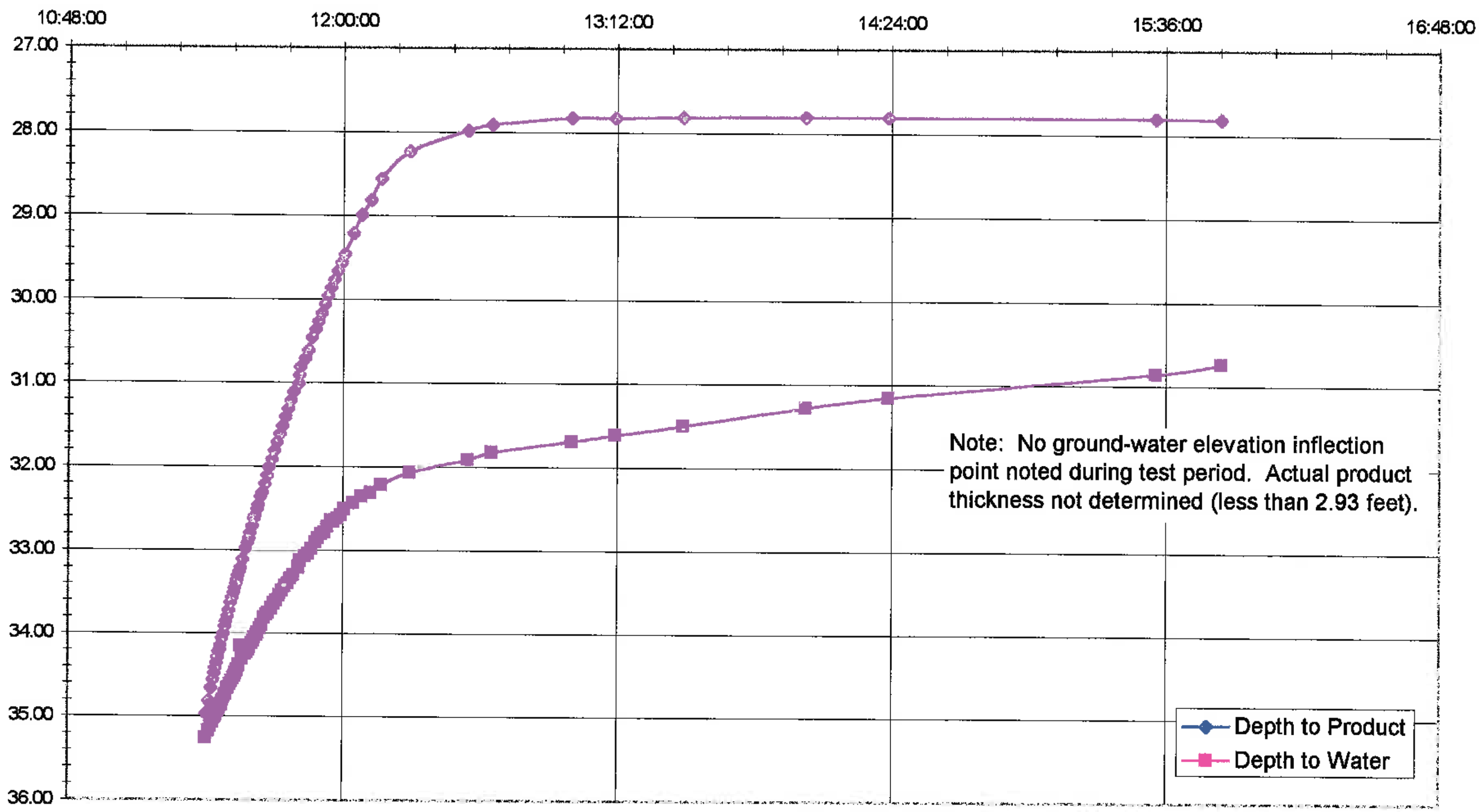
MW-7

Measurement	(Time) - Elapsed Time	DTP (ft)	DTW (ft)	Drawdown (H) (ft)	H/Ho
50	11'50"	27.50	27.74	-0.71	-0.317
51	12'20"	27.48	27.72	-0.73	-0.326
52	13'10"	27.45	27.69	-0.76	-0.339
53	14'00"	27.42	27.66	-0.79	-0.353
54	15'30"	27.38	27.63	-0.82	-0.366
55	16'30"	27.36	27.59	-0.86	-0.384
56	16'55"	27.35	27.59	-0.86	-0.384
57	19'00"	27.31	27.56	-0.89	-0.397
58	21'20"	27.28	27.54	-0.91	-0.406
59	22'40"	27.27	27.51	-0.94	-0.420
60	25'45"	27.24	27.49	-0.96	-0.429
61	30'10"	27.21	27.45	-1.00	-0.446
62	43'20"	27.17	27.41	-1.04	-0.464
63	2 36 20	27.17	27.42	-1.03	-0.460
64	2 39 20	27.17	27.42	-1.03	-0.460
65	2 50 50	27.16	27.40	-1.05	-0.469
66	11 30 00	26.99	28.04		

Potesta & Associates, Inc.
2300 MacCorkle Ave. SE
Charleston, WV 25304 Phone: (304) 342-1400, Fax: (304) 343-9031

MW-7

LNAPL Recovery Area
Well B-1 Baildown Test Results



ROUX ASSOCIATES INC

MO06619J08.56

Well B-1 Product Bail-Down Test Results

	Time	Depth to Product	Depth to Water	Product Thickness
11:24:24	11:24:24	34.96	35.25	0.29
0:00:36	11:25:00	34.81	35.17	0.36
0:01:15	11:25:39	34.65	35.11	0.46
0:01:45	11:26:09	34.55	35.06	0.51
0:02:03	11:26:27	34.47	35.02	0.55
0:02:27	11:26:51	34.41	35.00	0.59
0:02:38	11:27:02	34.35	34.97	0.62
0:02:56	11:27:20	34.28	34.94	0.66
0:03:12	11:27:36	34.22	34.91	0.69
0:03:28	11:27:52	34.19	34.90	0.71
0:03:40	11:28:04	34.14	34.86	0.72
0:04:04	11:28:28	34.05	34.85	0.8
0:04:26	11:28:50	34.00	34.80	0.8
0:04:50	11:29:14	33.91	34.75	0.84
0:05:07	11:29:31	33.85	34.73	0.88
0:05:33	11:29:57	33.79	34.66	0.87
0:05:48	11:30:12	33.72	34.65	0.93
0:06:17	11:30:41	33.63	34.61	0.98
0:06:39	11:31:03	33.56	34.57	1.01
0:07:10	11:31:34	33.50	34.54	1.04
0:07:23	11:31:47	33.45	34.51	1.06
0:07:40	11:32:04	33.40	34.48	1.08
0:07:58	11:32:22	33.35	34.45	1.1
0:08:12	11:32:36	33.30	34.44	1.14
0:08:30	11:32:54	33.25	34.38	1.13
0:08:49	11:33:13	33.20	34.15	0.95
0:09:25	11:33:49	33.10	34.31	1.21
0:10:12	11:34:36	32.97	34.25	1.28
0:10:40	11:35:04	32.90	34.23	1.33
0:10:57	11:35:21	32.85	34.20	1.35
0:11:17	11:35:41	32.78	34.17	1.39
0:11:55	11:36:19	32.70	34.12	1.42
0:12:17	11:36:41	32.61	34.09	1.48
0:12:34	11:36:58	32.58	34.05	1.47
0:13:07	11:37:31	32.50	34.02	1.52
0:13:25	11:37:49	32.45	33.99	1.54
0:13:58	11:38:22	32.35	33.94	1.59
0:14:28	11:38:52	32.30	33.90	1.6
0:15:10	11:39:34	32.20	33.81	1.61
0:15:43	11:40:07	32.10	33.77	1.67
0:16:10	11:40:34	32.00	33.75	1.75
0:17:00	11:41:24	31.90	33.70	1.8
0:17:41	11:42:05	31.80	33.64	1.84
0:18:23	11:42:47	31.70	33.60	1.9
0:19:04	11:43:28	31.60	33.54	1.94
0:19:45	11:44:09	31.50	33.48	1.98
0:20:29	11:44:53	31.40	33.43	2.03
0:21:10	11:45:34	31.30	33.40	2.1
0:21:52	11:46:16	31.20	33.34	2.14
0:22:37	11:47:01	31.10	33.29	2.19
0:23:52	11:48:16	31.00	33.21	2.21

Well B-1 Product Bail-Down Test Results

	Time	Depth to Product	Depth to Water	Product Thickness
0:24:05	11:48:29	30.90	33.19	2.29
0:24:20	11:48:44	30.80	33.12	2.32
0:25:38	11:50:02	30.70	33.07	2.37
0:26:30	11:50:54	30.60	33.04	2.44
0:27:27	11:51:51	30.45	32.98	2.53
0:28:21	11:52:45	30.35	32.90	2.55
0:29:09	11:53:33	30.25	32.85	2.6
0:30:00	11:54:24	30.15	32.80	2.65
0:30:46	11:55:10	30.05	32.78	2.73
0:31:35	11:55:59	29.95	32.71	2.76
0:32:23	11:56:47	29.85	32.64	2.79
0:33:14	11:57:38	29.75	32.65	2.9
0:34:10	11:58:34	29.65	32.61	2.96
0:35:06	11:59:30	29.55	32.57	3.02
0:35:58	12:00:22	29.45	32.50	3.05
0:38:21	12:02:45	29.20	32.43	3.23
0:40:30	12:04:54	28.98	32.35	3.37
0:42:55	12:07:19	28.80	32.30	3.5
0:45:35	12:09:59	28.55	32.21	3.66
0:53:06	12:17:30	28.22	32.06	3.84
1:08:16	12:32:40	27.97	31.90	3.93
1:14:42	12:39:06	27.90	31.81	3.91
1:35:36	13:00:00	27.81	31.68	3.87
1:47:06	13:11:30	27.81	31.60	3.79
2:04:56	13:29:20	27.80	31.49	3.69
2:37:06	14:01:30	27.79	31.27	3.48
2:58:51	14:23:15	27.79	31.14	3.35
4:09:05	15:33:29	27.79	30.85	3.06
4:26:06	15:50:30	27.80	30.73	2.93

Client:	Solutia, Inc.	Date:	1/7/99
Facility:	Solutia, Inc.	Project No.:	97026
	Nitro Plant	Field Staff:	C. Henderson, D. Stottlemyer
	LNAPL Area	Test Well:	B-1

SUMMARY OF TEST DATA - BAILDOWN TEST

MW DATA:

Test Well I.D.	B-1	Dia. of Well:	2", PVC
Initial DTW (ft):	29.61	Date/Time:	1-7-99/1115
Initial DTP (ft):	27.80		
Equipment:	Solinst Interface Probe		

EVACUATION SUMMARY:

Total Volume Fluid Removed: 2.0 gal.
Vol. Product Removed: 1.0 gal.
Vol. Water Removed: 1.0 gal.
Evacuation Method: Bailer

LEGEND:

Drawdown (H) = DTW_t - DTW_0; DTW = Depth to Water; DTP = Depth to Product

** Continue Recharge Measurements until H/H_0 = 0.37

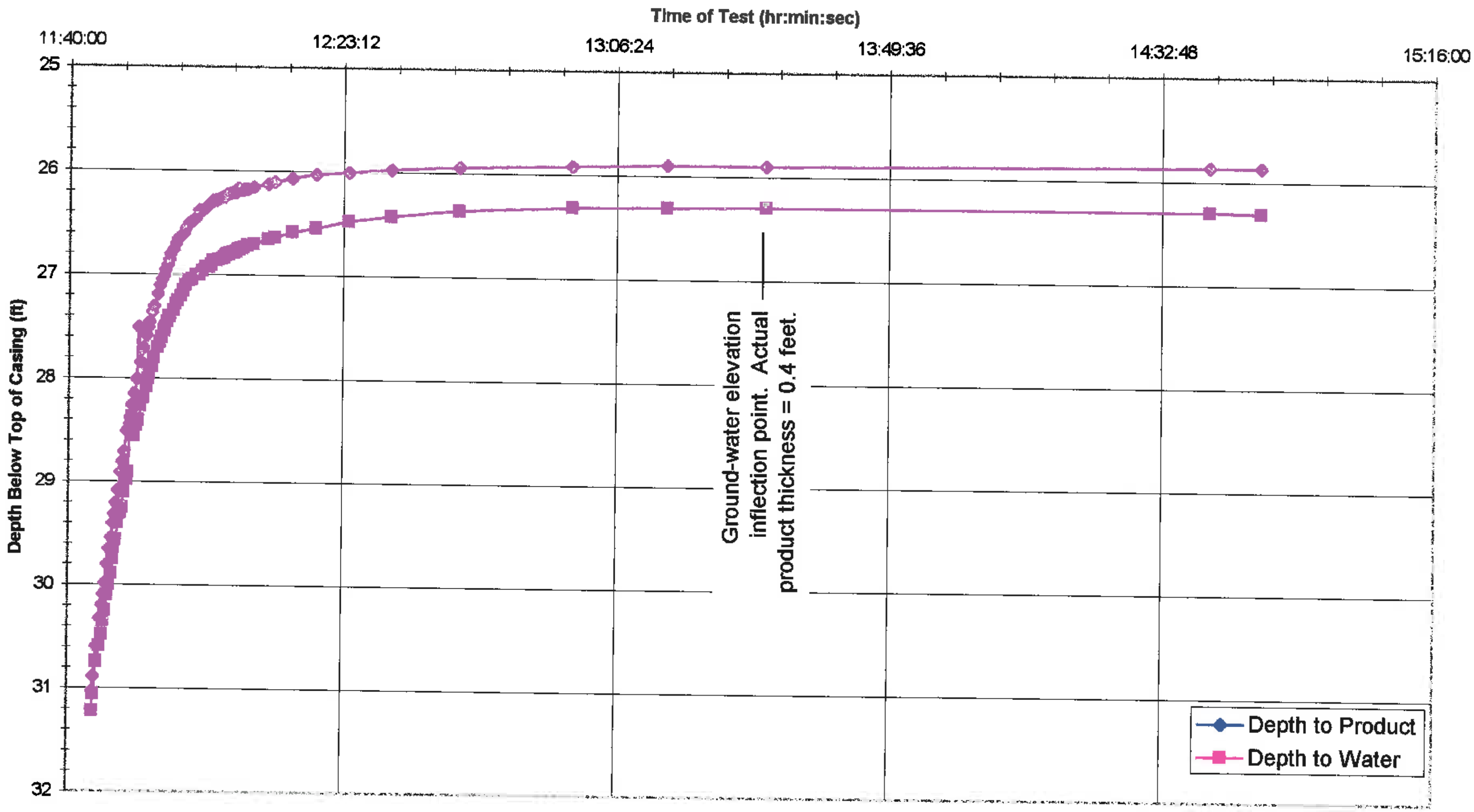
Measurement	(Time)- Elapsed Time	DTP (ft)	DTW (ft)	Drawdown (H) (ft)	H/H_0
1	(11:24' 24")	34.96	35.25	5.64	1.000
2	0:00:36	34.81	35.17	5.56	0.986
3	0:01:15	34.65	35.11	5.50	0.975
4	0:01:45	34.55	35.06	5.45	0.966
5	0:02:03	34.47	35.02	5.41	0.959
6	0:02:27	34.41	35.00	5.39	0.956
7	0:02:38	34.35	34.97	5.36	0.950
8	0:02:56	34.28	34.94	5.33	0.945
9	0:03:12	34.22	34.91	5.30	0.940
10	0:03:28	34.19	34.90	5.29	0.938
11	0:03:40	34.14	34.86	5.25	0.931
12	0:04:04	34.05	34.85	5.24	0.929
13	0:04:26	34.00	34.80	5.19	0.920
14	0:04:50	33.91	34.75	5.14	0.911
15	0:05:07	33.85	34.73	5.12	0.908
16	0:05:33	33.79	34.66	5.05	0.895
17	0:05:48	33.72	34.65	5.04	0.894
18	0:06:17	33.63	34.61	5.00	0.887
19	0:06:39	33.56	34.57	4.96	0.879
20	0:07:10	33.50	34.54	4.93	0.874
21	0:07:23	33.45	34.51	4.90	0.869
22	0:07:40	33.40	34.48	4.87	0.863
23	0:07:58	33.35	34.45	4.84	0.858
24	0:08:12	33.30	34.44	4.83	0.856
25	0:08:30	33.25	34.38	4.77	0.846
26	0:08:49	33.20	34.15	4.54	0.805

Measurement	(Time)- Elapsed Time	DTP (ft)	DTW (ft)	Drawdown (H) (ft)	H/H_0
27	0:09:25	33.10	34.31	4.70	0.833
28	0:10:12	32.97	34.25	4.64	0.823
29	0:10:40	32.90	34.23	4.62	0.819
30	0:10:57	32.85	34.20	4.59	0.814
31	0:11:17	32.78	34.17	4.56	0.809
32	0:11:55	32.70	34.12	4.51	0.800
33	0:12:17	32.61	34.09	4.48	0.794
34	0:12:34	32.58	34.05	4.44	0.787
35	0:13:07	32.50	34.02	4.41	0.782
36	0:13:25	32.45	33.99	4.38	0.777
37	0:13:58	32.35	33.94	4.33	0.768
38	0:14:28	32.30	33.90	4.29	0.761
39	0:15:10	32.20	33.81	4.20	0.745
40	0:15:43	32.10	33.77	4.16	0.738
41	0:16:10	32.00	33.75	4.14	0.734
42	0:17:00	31.90	33.70	4.09	0.725
43	0:17:41	31.80	33.64	4.03	0.715
44	0:18:23	31.70	33.60	3.99	0.707
45	0:19:04	31.60	33.54	3.93	0.697
46	0:19:45	31.50	33.48	3.87	0.686
47	0:20:29	31.40	33.43	3.82	0.677
48	0:21:10	31.30	33.40	3.79	0.672
49	0:21:52	31.20	33.34	3.73	0.661
50	0:22:37	31.10	33.29	3.68	0.652
51	0:23:52	31.00	33.21	3.60	0.638
52	0:24:05	30.90	33.19	3.58	0.635
53	0:24:20	30.80	33.12	3.51	0.622
54	0:25:38	30.70	33.07	3.46	0.613
55	0:26:30	30.60	33.04	3.43	0.608
56	0:27:27	30.45	32.98	3.37	0.598
57	0:28:21	30.35	32.90	3.29	0.583
58	0:29:09	30.25	32.85	3.24	0.574
59	0:30:00	30.15	32.80	3.19	0.566
60	0:30:46	30.05	32.78	3.17	0.562
61	0:31:35	29.95	32.71	3.10	0.550
62	0:32:23	29.85	32.64	3.03	0.537
63	0:33:14	29.75	32.65	3.04	0.539
64	0:34:10	29.65	32.61	3.00	0.532
65	0:35:06	29.55	32.57	2.96	0.525
66	0:35:58	29.45	32.50	2.89	0.512
67	0:38:21	29.20	32.43	2.82	0.500
68	0:40:30	28.98	32.35	2.74	0.486
69	0:42:55	28.80	32.30	2.69	0.477
70	0:45:35	28.55	32.21	2.60	0.461
71	0:53:06	28.22	32.06	2.45	0.434
72	1:08:16	27.97	31.90	2.29	0.406
73	1:14:42	27.90	31.81	2.20	0.390
74	1:35:36	27.81	31.68	2.07	0.367
75	1:47:06	27.81	31.60	1.99	0.353

Potesta Associates, Inc.
2300 MacCorkle Ave, SE
Charleston, WV 25304

Measurement	(Time)- Elapsed Time	DTP (ft)	DTW (ft)	Drawdown (H) (ft)	H/H_0
76	2:04:56	27.80	31.49	1.88	0.333
77	2:37:06	27.79	31.27	1.66	0.294
78	2:58:51	27.79	31.14	1.53	0.271
79	4:09:05	27.79	30.85	1.24	0.220
80	4:26:06	27.80	30.73	1.12	0.199

LNAPL Recovery Area
Well B-2 Baildown Test Results



ROUX ASSOCIATES INC

MO06619J08.56

Well B-2 Product Bail-Down Test Results

	Time	Depth to Product	Depth to Water	Product Thickness
11:44:00	11:44:00	31.02	31.22	0.2
0:00:07	11:44:07	30.88	31.05	0.17
0:00:37	11:44:37	30.59	30.74	0.15
0:01:06	11:45:06	30.32	30.59	0.27
0:01:26	11:45:26	30.19	30.48	0.29
0:01:36	11:45:36	30.09	30.35	0.26
0:01:52	11:45:52	29.98	30.25	0.27
0:02:12	11:46:12	29.8	30.1	0.3
0:02:28	11:46:28	29.65	30	0.35
0:02:46	11:46:46	29.54	29.89	0.35
0:03:03	11:47:03	29.4	29.75	0.35
0:03:15	11:47:15	29.31	29.64	0.33
0:03:30	11:47:30	29.2	29.56	0.36
0:03:50	11:47:50	29.08	29.4	0.32
0:04:12	11:48:12	28.9	29.3	0.4
0:04:28	11:48:28	28.8	29.25	0.45
0:04:46	11:48:46	28.7	29.1	0.4
0:05:09	11:49:09	28.5	28.98	0.48
0:05:22	11:49:22	28.48	28.9	0.42
0:05:41	11:49:41	28.37	28.48	0.11
0:05:55	11:49:55	28.25	28.37	0.12
0:06:16	11:50:16	28.14	28.55	0.41
0:06:43	11:50:43	28	28.45	0.45
0:06:59	11:50:59	27.5	28.4	0.9
0:07:18	11:51:18	27.84	28.26	0.42
0:07:44	11:51:44	27.7	28.18	0.48
0:08:11	11:52:11	27.58	28.08	0.5
0:08:30	11:52:30	27.5	28	0.5
0:08:40	11:52:40	27.45	27.95	0.5
0:09:02	11:53:02	27.35	27.88	0.53
0:09:20	11:53:20	27.3	27.8	0.5
0:09:57	11:53:57	27.18	27.7	0.52
0:10:18	11:54:18	27.1	27.65	0.55
0:10:38	11:54:38	27.04	27.6	0.56
0:10:54	11:54:54	27	27.54	0.54
0:11:08	11:55:08	26.95	27.5	0.55
0:11:28	11:55:28	26.9	27.45	0.55
0:11:42	11:55:42	26.85	27.4	0.55
0:11:54	11:55:54	26.8	27.4	0.6
0:12:21	11:56:21	26.75	27.34	0.59
0:12:44	11:56:44	26.7	27.28	0.58
0:13:06	11:57:06	26.65	27.25	0.6
0:13:32	11:57:32	26.62	27.2	0.58
0:13:52	11:57:52	26.6	27.15	0.55
0:14:17	11:58:17	26.55	27.1	0.55
0:14:46	11:58:46	26.5	27.05	0.55
0:15:16	11:59:16	26.48	27.04	0.56
0:15:52	11:59:52	26.45	27	0.55
0:16:21	12:00:21	26.38	27	0.62
0:16:53	12:00:53	26.38	26.96	0.58
0:17:22	12:01:22	26.35	26.92	0.57

Well B-2 Product Bail-Down Test Results

	Time	Depth to Product	Depth to Water	Product Thickness
0:17:52	12:01:52	26.32	26.92	0.6
0:18:19	12:02:19	26.3	26.9	0.6
0:18:36	12:02:36	26.28	26.86	0.58
0:19:04	12:03:04	26.28	26.86	0.58
0:19:24	12:03:24	26.27	26.85	0.58
0:20:02	12:04:02	26.25	26.84	0.59
0:20:19	12:04:19	26.25	26.83	0.58
0:20:34	12:04:34	26.24	26.81	0.57
0:20:49	12:04:49	26.22	26.8	0.58
0:21:09	12:05:09	26.22	26.8	0.58
0:21:20	12:05:20	26.21	26.79	0.58
0:21:36	12:05:36	26.2	26.78	0.58
0:21:55	12:05:55	26.2	26.78	0.58
0:22:14	12:06:14	26.2	26.77	0.57
0:22:28	12:06:28	26.16	26.75	0.59
0:22:44	12:06:44	26.18	26.75	0.57
0:22:59	12:06:59	26.18	26.74	0.56
0:23:11	12:07:11	26.18	26.74	0.56
0:23:26	12:07:26	26.17	26.73	0.56
0:24:02	12:08:02	26.17	26.71	0.54
0:24:57	12:08:57	26.15	26.7	0.55
0:27:15	12:11:15	26.12	26.65	0.53
0:28:13	12:12:13	26.1	26.63	0.53
0:31:03	12:15:03	26.06	26.58	0.52
0:34:45	12:18:45	26.02	26.54	0.52
0:40:00	12:24:00	26	26.47	0.47
0:46:38	12:30:38	25.97	26.42	0.45
0:57:28	12:41:28	25.94	26.36	0.42
1:15:15	12:59:15	25.91	26.31	0.4
1:30:18	13:14:18	25.89	26.3	0.41
1:46:00	13:30:00	25.89	26.29	0.4
2:56:14	14:40:14	25.86	26.29	0.43
3:04:25	14:48:25	25.86	26.3	0.44

Client: SOLUTIA, INC.
Facility: LNAPL UNIT
SOLUTIA INC.
NITRO, WV.

Date: 12-21-98
Project No.: 9
Field Staff: R. MOORE / C. GROSE
Test Well: B-2

SUMMARY OF TEST DATA - BAILOUT TEST

MW DATA:

Test Well I.D. B-2 Diameter of MW: 2" PVC

Initial DTW (ft): 25.77 Date/Time: 12-21-98 / 1120

Initial Depth to Product (ft): 27.02

Equipment Used for Measurement: INTERPHASE PROBE

EVACUATION SUMMARY:

Total Volume Fluid Removed: ~4 gallons;

Vol. Product Removed ~1 gallons; Vol. Water Removed: ~3 gallons

Evacuation Method: BAILER

LEGEND:

Drawdown (H) = DTW_t - DTW_o; DTW = Depth to Water; DTP = Depth to Product

** Continue Recharge Measurements until H/H_o = 0.37

Measurement	(Time) - Elapsed Time	DTP (ft)	DTW (ft)	Drawdown (H) (ft)	H/Ho
1	(1144) 0	31.02	31.22	H_o = 5.45	1.0
2	7"	30.88	31.05	5.28	0.969
3	37"	30.59	30.74	4.97	0.912
4	1'06"	30.32	30.59	4.82	0.884
5	1'26"	30.19	30.48	4.71	0.864
6	1'36"	30.09	30.35	4.58	0.840
7	1'52"	29.98	30.25	4.48	0.822
8	2'12"	29.80	30.10	4.33	0.794
9	2'28"	29.65	30.00	4.23	0.776
10	2'46"	29.54	29.89	4.12	0.756
11	3'03"	29.40	29.75	3.98	0.730
12	3'15"	29.31	29.64	3.87	0.710
13	3'30"	29.20	29.56	3.79	0.695
14	3'50"	29.08	29.40	3.63	0.666
15	4'12"	28.90	29.30	3.53	0.648
16	4'28"	28.8	29.25	3.48	0.639

Measurement	(Time) - Elapsed Time	DTP (ft)	DTW (ft)	Drawdown (H) (ft)	H/Ho
17	4'46"	28.7	29.1	3.33	0.611
18	5'09"	28.5	28.98	3.21	0.589
19	5'22"	28.48	28.9	3.13	0.574
20	5'41"	28.37	28.48	2.71	0.497
21	5'55"	28.25	28.37	2.60	0.477
22	6'16"	28.14	28.55	2.78	0.510
23	6'43"	28.0	28.45	2.68	0.492
24	6'59"	27.5	28.4	2.63	0.483
25	7'18"	27.84	28.26	2.49	0.457
26	7'44"	27.7	28.18	2.41	0.442
27	8'11"	27.58	28.08	2.31	0.424
28	8'30"	27.5	28.0	2.23	0.409
29	8'40"	27.45	27.95	2.18	0.400
30	9'02"	27.35	27.88	2.11	0.387
31	9'20"	27.30	27.8	2.03	0.372
32	9'57"	27.18	27.7	1.93	0.354
33	10'18"	27.1	27.65	1.88	0.345
34	10'38"	27.04	27.6	1.83	0.336
35	10'54"	27.0	27.54	1.77	0.325
36	11'08"	26.95	27.5	1.73	0.317
37	11'28"	26.9	27.45	1.68	0.308
38	11'42"	26.85	27.4	1.63	0.299
39	11'54"	26.8	27.4	1.63	0.299
40	12'21"	26.75	27.34	1.57	0.288
41	12'44"	26.7	27.28	1.51	0.277
42	13'06"	26.65	27.25	1.48	0.272
43	13'32"	26.62	27.2	1.43	0.262
44	13'52"	26.60	27.15	1.38	0.253
45	14'17"	26.55	27.10	1.33	0.244
46	14'46"	26.5	27.05	1.28	0.235
47	15'16"	26.48	27.04	1.27	0.233
48	15'52"	26.45	27.0	1.23	0.226
49	16'21"	26.38	27.0	1.23	0.226

Potesta & Associates, Inc.
2300 MacCorkle Ave. SE
Charleston, WV 25304 Phone: (304) 342-1400, Fax: (304) 343-9031

Measurement	(Time) - Elapsed Time	DTP (ft)	DTW (ft)	Drawdown (H) (ft)	H/Ho
50	16' 53"	26.38	26.96	1.19	0.218
51	17' 22"	26.35	26.92	1.15	0.211
52	17' 52"	26.32	26.92	1.15	0.211
53	18' 19"	26.30	26.90	1.13	0.207
54	18' 36"	26.28	26.86	1.09	0.200
55	19' 04"	26.28	26.86	1.09	0.200
56	19' 24"	26.27	26.85	1.08	0.198
57	20' 02"	26.25	26.84	1.07	0.196
58	20' 19"	26.25	26.83	1.06	0.194
59	20' 34"	26.24	26.81	1.04	0.191
60	20' 49"	26.22	26.80	1.03	0.189
61	21' 09"	26.22	26.80	1.03	0.189
62	21' 20"	26.21	26.79	1.02	0.187
63	21' 36"	26.20	26.78	1.01	0.185
64	21' 55"	26.20	26.78	1.01	0.185
65	22' 14"	26.20	26.77	1.0	0.183
66	22' 28"	26.19	26.75	0.98	0.180
67	22' 44"	26.18	26.75	0.98	0.180
68	22' 59"	26.18	26.74	0.97	0.178
69	23' 11"	26.18	26.74	0.97	0.178
70	23' 26"	26.17	26.73	0.96	0.176
71	24' 02"	26.17	26.71	0.94	0.172
72	24' 57"	26.16	26.70	0.93	0.171
73	27' 15"	26.12	26.65	0.88	0.161
74	28' 13"	26.10	26.63	0.86	0.158
75	31' 03"	26.06	26.58	0.81	0.149
76	34' 45"	26.02	26.54	0.77	0.141
77	40' 00"	26.0	26.47	0.70	0.128
78	46' 38"	25.97	26.42	0.65	0.119
79	57' 28"	25.94	26.36	0.59	0.108
80	1 15' 15"	25.91	26.31	0.54	0.099
81	1 30' 18"	25.89	26.30	0.53	0.097
82	1 46' 00"	25.89	26.29	0.52	0.095

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Measurement	(Time) - Elapsed Time	DTP (ft)	DTW (ft)	Drawdown (H) (ft)	H/Ho
83	2 56' 14"	25.86	26.29	0.52	0.095
84	3 4' 25"	25.86	26.30	0.53	0.097

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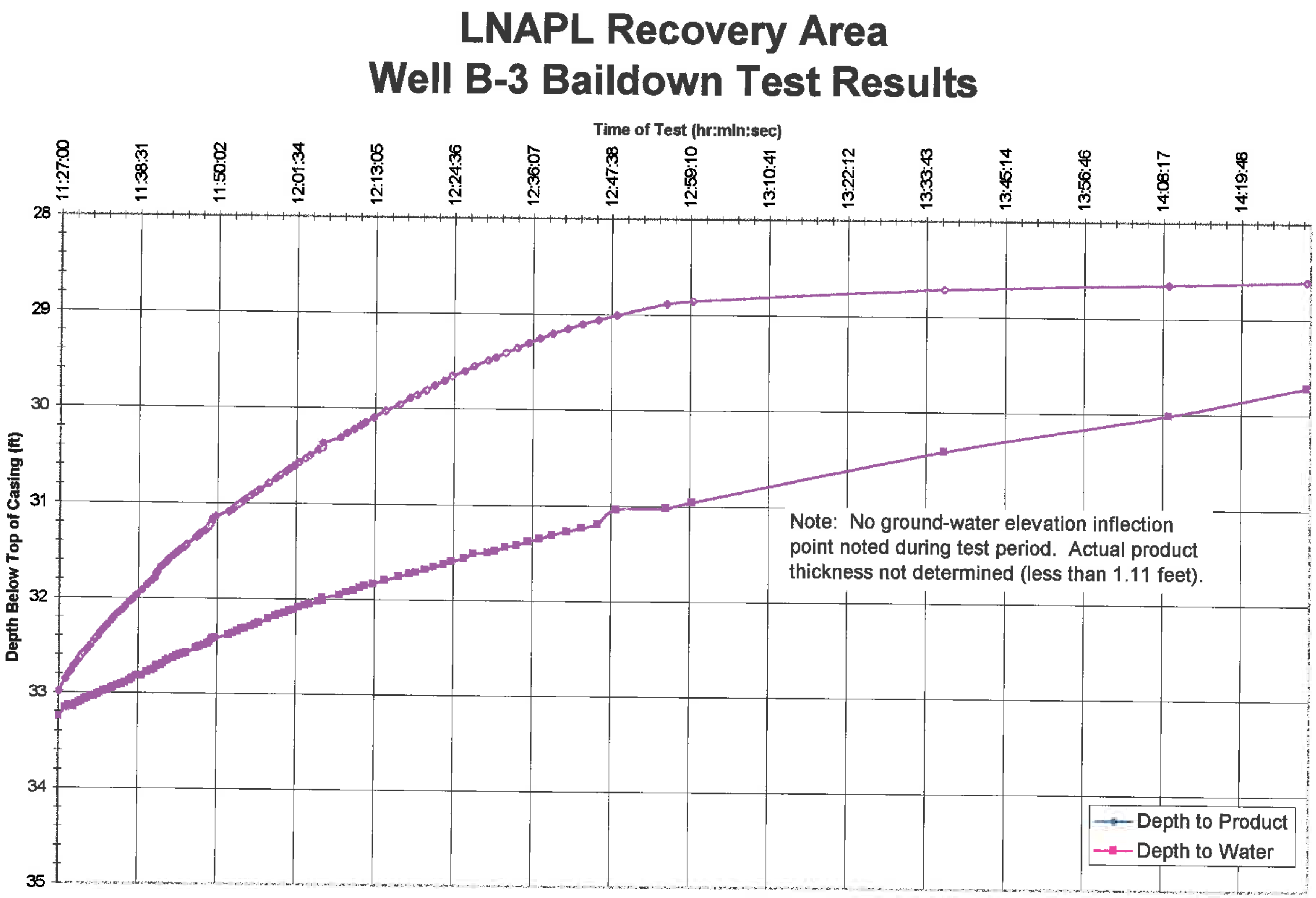
Charleston, WV 25304 Phone: (304) 342-1400, Fax: (304) 343-9031



ROUX ASSOCIATES INC

MO06619J08.56

Well B-3 Product Bail-Down Test Results

	Time	Depth to Product	Depth to Water	Product Thickness
11:27:00	11:27:00	32.98	33.25	0.27
0:01:00	11:28:00	32.85	33.16	0.31
0:01:30	11:28:30	32.79	33.14	0.35
0:01:50	11:28:50	32.76	33.14	0.38
0:02:10	11:29:10	32.71	33.15	0.44
0:02:30	11:29:30	32.69	33.12	0.43
0:03:00	11:30:00	32.64	33.11	0.47
0:03:20	11:30:20	32.6	33.09	0.49
0:03:50	11:30:50	32.56	33.07	0.51
0:04:10	11:31:10	32.53	33.06	0.53
0:04:40	11:31:40	32.49	33.04	0.55
0:05:10	11:32:10	32.44	33.03	0.59
0:05:40	11:32:40	32.4	33.02	0.62
0:06:00	11:33:00	32.36	33	0.64
0:06:30	11:33:30	32.32	32.98	0.66
0:07:05	11:34:05	32.28	32.97	0.69
0:07:40	11:34:40	32.23	32.95	0.72
0:08:00	11:35:00	32.2	32.94	0.74
0:08:35	11:35:35	32.16	32.92	0.76
0:09:10	11:36:10	32.12	32.91	0.79
0:09:40	11:36:40	32.08	32.89	0.81
0:10:20	11:37:20	32.03	32.87	0.84
0:10:40	11:37:40	32.01	32.85	0.84
0:11:20	11:38:20	31.96	32.82	0.86
0:12:05	11:39:05	31.91	32.82	0.91
0:12:50	11:39:50	31.85	32.78	0.93
0:13:30	11:40:30	31.81	32.76	0.95
0:14:00	11:41:00	31.78	32.75	0.97
0:14:10	11:41:10	31.74	32.72	0.98
0:14:20	11:41:20	31.71	32.71	1
0:14:50	11:41:50	31.66	32.71	1.05
0:15:10	11:42:10	31.64	32.69	1.05
0:15:40	11:42:40	31.61	32.66	1.05
0:16:00	11:43:00	31.58	32.65	1.07
0:16:40	11:43:40	31.54	32.63	1.09
0:17:10	11:44:10	31.51	32.61	1.1
0:17:40	11:44:40	31.48	32.59	1.11
0:18:10	11:45:10	31.46	32.58	1.12
0:18:35	11:45:35	31.43	32.57	1.14
0:20:00	11:47:00	31.35	32.52	1.17
0:20:20	11:47:20	31.33	32.51	1.18
0:20:35	11:47:35	31.31	32.5	1.19
0:21:10	11:48:10	31.28	32.49	1.21
0:21:40	11:48:40	31.25	32.47	1.22
0:22:00	11:49:00	31.22	32.46	1.24
0:22:15	11:49:15	31.18	32.43	1.25
0:22:25	11:49:25	31.15	32.42	1.27
0:22:50	11:49:50	31.13	32.41	1.28
0:24:45	11:51:45	31.08	32.38	1.3
0:25:20	11:52:20	31.05	32.36	1.31
0:26:00	11:53:00	31.01	32.34	1.33

Well B-3 Product Bail-Down Test Results

	Time	Depth to Product	Depth to Water	Product Thickness
0:26:40	11:53:40	30.98	32.32	1.34
0:27:10	11:54:10	30.95	32.31	1.36
0:28:00	11:55:00	30.91	32.29	1.38
0:28:35	11:55:35	30.88	32.27	1.39
0:29:10	11:56:10	30.85	32.25	1.4
0:30:30	11:57:30	30.78	32.21	1.43
0:31:35	11:58:35	30.73	32.18	1.45
0:32:10	11:59:10	30.7	32.16	1.46
0:33:00	12:00:00	30.66	32.14	1.48
0:33:35	12:00:35	30.63	32.12	1.49
0:34:15	12:01:15	30.6	32.11	1.51
0:35:00	12:02:00	30.56	32.08	1.52
0:35:55	12:02:55	30.52	32.06	1.54
0:36:30	12:03:30	30.49	32.05	1.56
0:37:50	12:04:50	30.43	32.02	1.59
0:38:30	12:05:30	30.4	32.01	1.61
0:38:25	12:05:25	30.36	31.98	1.62
0:41:00	12:08:00	30.3	31.95	1.65
0:42:00	12:09:00	30.25	31.92	1.67
0:43:00	12:10:00	30.21	31.9	1.69
0:43:55	12:10:55	30.17	31.87	1.7
0:44:35	12:11:35	30.14	31.85	1.71
0:45:50	12:12:50	30.09	31.83	1.74
0:47:35	12:14:35	30.02	31.79	1.77
0:49:35	12:16:35	29.95	31.75	1.8
0:51:10	12:18:10	29.88	31.72	1.84
0:52:10	12:19:10	29.85	31.7	1.85
0:53:30	12:20:30	29.8	31.67	1.87
0:54:40	12:21:40	29.75	31.64	1.89
0:56:10	12:23:10	29.7	31.61	1.91
0:57:20	12:24:20	29.65	31.58	1.93
0:59:10	12:26:10	29.6	31.55	1.95
1:00:30	12:27:30	29.55	31.5	1.95
1:02:35	12:29:35	29.48	31.49	2.01
1:03:40	12:30:40	29.45	31.47	2.02
1:05:10	12:32:10	29.4	31.43	2.03
1:06:50	12:33:50	29.35	31.41	2.06
1:08:30	12:35:30	29.3	31.37	2.07
1:10:10	12:37:10	29.25	31.34	2.09
1:12:00	12:39:00	29.2	31.3	2.1
1:14:10	12:41:10	29.15	31.26	2.11
1:16:20	12:43:20	29.1	31.22	2.12
1:18:40	12:45:40	29.05	31.18	2.13
1:21:25	12:48:25	29	31.03	2.03
1:28:40	12:55:40	28.88	31.01	2.13
1:32:30	12:59:30	28.85	30.95	2.1
2:09:20	13:36:20	28.71	30.4	1.69
2:42:10	14:09:10	28.64	30.01	1.37
3:02:25	14:29:25	28.6	29.71	1.11

Client: SOLUTIA, INC
Facility: LNAPL UNIT
SOLUTIA, INC.
NITRO, WV.

Date: 12-29-98
Project No.: 97026
Field Staff: D STOTTLEMYER / C. GROSE
Test Well: B-3

SUMMARY OF TEST DATA - BAILOUT TEST

MW DATA:

Test Well I.D. B-3 Diameter of MW: 2" PVC
Initial DTW (ft): 29.93 Date/Time: 12-29-98/1125
Initial Depth to Product (ft): 27.85
Equipment Used for Measurement: INTERPHASE PROBE

EVACUATION SUMMARY:

Total Volume Fluid Removed: 2.3 gallons;
Vol. Product Removed 1.65 gallons; Vol. Water Removed: 0.75 gallons
Evacuation Method: BAILER

LEGEND:

Drawdown (H) = $DTW_t - DTW_o$; DTW = Depth to Water; DTP = Depth to Product
** Continue Recharge Measurements until $H/H_o = 0.37$

Measurement	(Time) - Elapsed Time	DTP (ft)	DTW (ft)	Drawdown (H) (ft)	H/Ho
1	(1127) 0	32.98	33.25	H_o = 3.32	1.0
2	1' 00"	32.85	33.16	3.23	0.973
3	1'30"	32.79	33.14	3.21	0.967
4	1'50"	32.76	33.14	3.21	0.967
5	2'10"	32.71	33.15	3.22	0.970
6	2'30"	32.69	33.12	3.19	0.961
7	3'00"	32.64	33.11	3.18	0.958
8	3'20"	32.60	33.09	3.16	0.952
9	3'50"	32.56	33.07	3.14	0.946
10	4'10"	32.53	33.06	3.13	0.943
11	4'40"	32.49	33.04	3.11	0.937
12	5'10"	32.44	33.03	3.10	0.934
13	5'40"	32.40	33.02	3.09	0.931
14	6'00"	32.36	33.00	3.07	0.925
15	6'30"	32.32	32.98	3.05	0.919
16	7'05"	32.28	32.97	3.04	0.916

Measurement	(Time) - Elapsed Time	DTP (ft)	DTW (ft)	Drawdown (H) (ft)	H/Ho
17	7'40"	32.23	32.95	3.02	0.910
18	8'00"	32.20	32.94	3.01	0.907
19	8'35"	32.16	32.92	2.99	0.901
20	9'10"	32.12	32.91	2.98	0.898
21	9'40"	32.08	32.89	2.96	0.892
22	10'20"	32.03	32.87	2.94	0.886
23	10'40"	32.01	32.85	2.92	0.880
24	11'20"	31.96	32.82	2.89	0.870
25	12'05"	31.91	32.82	2.89	0.870
26	12'50"	31.85	32.78	2.85	0.858
27	13'30"	31.81	32.76	2.83	0.852
28	14'00"	31.78	32.75	2.82	0.849
29	14'10"	31.74	32.72	2.79	0.840
30	14'20"	31.71	32.71	2.78	0.837
31	14'50"	31.66	32.71	2.78	0.837
32	15'10"	31.64	32.69	2.76	0.831
33	15'40"	31.61	32.66	2.73	0.822
34	16'00"	31.58	32.65	2.72	0.819
35	16'40"	31.54	32.63	2.70	0.813
36	17'10"	31.51	32.61	2.68	0.807
37	17'40"	31.48	32.59	2.66	0.801
38	18'10"	31.46	32.58	2.65	0.798
39	18'35"	31.43	32.57	2.64	0.795
40	20'00"	31.35	32.52	2.59	0.780
41	20'20"	31.33	32.51	2.58	0.777
42	20'35"	31.31	32.50	2.57	0.774
43	21'10"	31.28	32.49	2.56	0.771
44	21'40"	31.25	32.47	2.54	0.765
45	22'00"	31.22	32.46	2.53	0.762
46	22'15"	31.18	32.43	2.50	0.753
47	22'25"	31.15	32.42	2.49	0.750
48	22'50"	31.13	32.41	2.48	0.747
49	24'45"	31.08	32.38	2.45	0.738

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Charleston, WV 25304 Phone: (304) 342-1400, Fax: (304) 343-9031

Measurement	(Time) - Elapsed Time	DTP (ft)	DTW (ft)	Drawdown (H) (ft)	H/Ho
50	25'20"	31.05	32.36	2.43	0.732
51	26'00"	31.01	32.34	2.41	0.726
52	26'40"	30.98	32.32	2.39	0.720
53	27'10"	30.95	32.31	2.38	0.717
54	28'00"	30.91	32.29	2.36	0.711
55	28'35"	30.88	32.27	2.34	0.705
56	29'10"	30.85	32.25	2.32	0.699
57	30'30"	30.78	32.21	2.28	0.687
58	31'35"	30.73	32.18	2.25	0.678
59	32'10"	30.70	32.16	2.23	0.672
60	33'00"	30.66	32.14	2.21	0.666
61	33'35"	30.63	32.12	2.19	0.660
62	34'15"	30.60	32.11	2.18	0.657
63	35'00"	30.56	32.08	2.15	0.648
64	35'55"	30.52	32.06	2.13	0.642
65	36'30"	30.49	32.05	2.12	0.639
66	37'50"	30.43	32.02	2.09	0.630
67	38'30"	30.40	32.01	2.08	0.627
68	39'25"	30.36	31.98	2.05	0.617
69	41'00"	30.30	31.95	2.02	0.608
70	42'00"	30.25	31.92	1.99	0.599
71	43'00"	30.21	31.90	1.97	0.593
72	43'55"	30.17	31.87	1.94	0.584
73	44'35"	30.14	31.85	1.92	0.578
74	45'50"	30.09	31.83	1.90	0.572
75	47'35"	30.02	31.79	1.86	0.560
76	49'35"	29.95	31.75	1.82	0.548
77	51'10"	29.88	31.72	1.79	0.539
78	52'10"	29.85	31.70	1.77	0.533
79	53'30"	29.80	31.67	1.74	0.524
80	54'40"	29.75	31.64	1.71	0.515
81	56'10"	29.70	31.61	1.68	0.506
82	57'20"	29.65	31.58	1.65	0.497

Measurement	(Time) - Elapsed Time	DTP (ft)	DTW (ft)	Drawdown (H) (ft)	H/Ho
83	59'10"	29.60	31.55	1.62	0.488
84	1 00'30"	29.55	31.50	1.57	0.473
85	1 02'35"	29.48	31.49	1.56	0.470
86	1 03'40"	29.45	31.47	1.54	0.464
87	1 05'10"	29.40	31.43	1.50	0.452
88	1 06'50"	29.35	31.41	1.48	0.446
89	1 08'30"	29.30	31.37	1.44	0.434
90	1 10'10"	29.25	31.34	1.41	0.425
91	1 12'00"	29.20	31.30	1.37	0.413
92	1 14'10"	29.15	31.26	1.33	0.401
93	1 16'20"	29.10	31.22	1.29	0.389
94	1 18'40"	29.05	31.18	1.25	0.377
95	1 21'25"	29.00	31.03	1.10	0.331
96	1 28'40"	28.88	31.01	1.08	0.325
97	1 32'30"	28.85	30.95	1.02	0.307
98	2 09'20"	28.71	30.40	0.47	0.142
99	2 42'10"	28.64	30.01	0.08	0.024
100	3 02'25"	28.60	29.71	-0.22	-0.066

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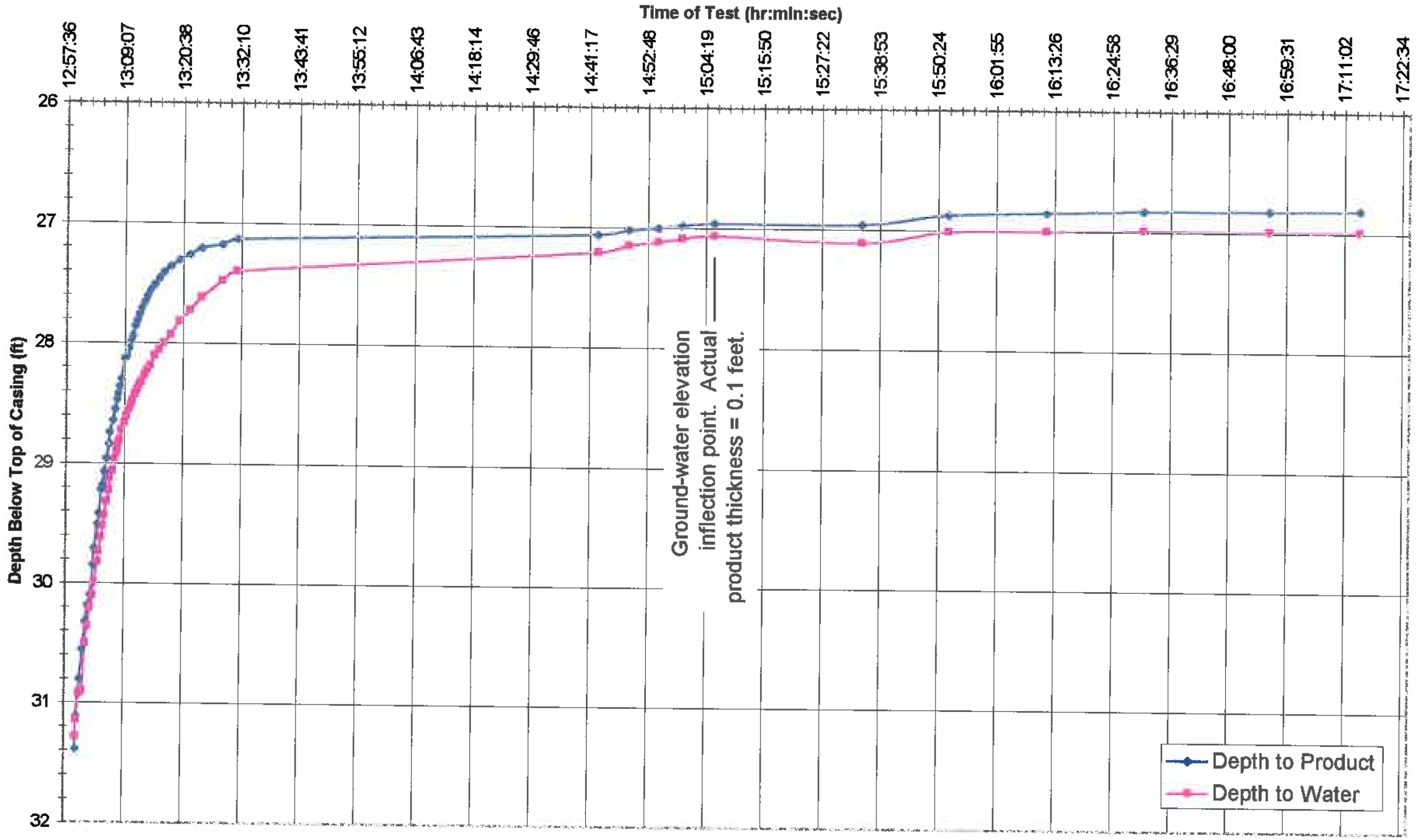
Charleston, WV 25304 Phone: (304) 342-1400, Fax: (304) 343-9031

B-3

LNAPL Recovery Area
Well B-4 Baildown Test Results



ROUX ASSOCIATES INC

MO06619J08.56

Well B-4 Product Bail-Down Test Results

	Time	Depth to Product	Depth to Water	Product Thickness
12:59:47	12:59:47	31.38	31.28	-0.1
0:00:08	12:59:55	31.11	31.14	0.03
0:00:40	13:00:27	30.8	30.92	0.12
0:01:13	13:01:00	30.55	30.9	0.35
0:01:45	13:01:32	30.32	30.5	0.18
0:02:08	13:01:55	30.18	30.36	0.18
0:02:41	13:02:28	30.09	30.2	0.11
0:03:09	13:02:56	29.84	30.1	0.26
0:03:25	13:03:12	29.7	29.99	0.29
0:04:03	13:03:50	29.5	29.82	0.32
0:04:18	13:04:05	29.41	29.73	0.32
0:04:42	13:04:29	29.21	29.61	0.4
0:05:04	13:04:51	29.17	29.52	0.35
0:05:23	13:05:10	29.06	29.43	0.37
0:05:47	13:05:34	28.95	29.31	0.36
0:06:13	13:06:00	28.83	29.22	0.39
0:06:23	13:06:10	28.73	29.12	0.39
0:07:01	13:06:48	28.63	29.05	0.42
0:07:26	13:07:13	28.54	28.96	0.42
0:07:48	13:07:35	28.46	28.9	0.44
0:08:01	13:07:48	28.41	28.84	0.43
0:08:20	13:08:07	28.35	28.8	0.45
0:08:39	13:08:26	28.29	28.72	0.43
0:09:14	13:09:01	28.12	28.66	0.54
0:09:40	13:09:27	28.1	28.6	0.5
0:10:02	13:09:49	28.04	28.55	0.51
0:10:29	13:10:16	27.98	28.51	0.53
0:10:46	13:10:33	27.93	28.47	0.54
0:11:19	13:11:06	27.85	28.42	0.57
0:11:45	13:11:32	27.8	28.38	0.58
0:12:08	13:11:55	27.75	28.34	0.59
0:12:35	13:12:22	27.7	28.31	0.61
0:13:08	13:12:55	27.65	28.26	0.61
0:13:40	13:13:27	27.6	28.22	0.62
0:14:20	13:14:07	27.55	28.18	0.63
0:15:08	13:14:55	27.5	28.1	0.6
0:16:00	13:15:47	27.45	28.05	0.6
0:16:59	13:16:46	27.4	27.99	0.59
0:18:16	13:18:03	27.35	27.92	0.57
0:20:05	13:19:52	27.3	27.81	0.51
0:22:10	13:21:57	27.25	27.72	0.47
0:24:25	13:24:12	27.2	27.61	0.41
0:28:31	13:28:18	27.17	27.47	0.3
0:31:29	13:31:16	27.12	27.39	0.27
1:43:05	14:42:52	27.05	27.2	0.15
1:49:09	14:48:56	27.01	27.14	0.13
1:55:00	14:54:47	26.99	27.11	0.12
1:59:46	14:59:33	26.97	27.08	0.11
2:06:07	15:05:54	26.95	27.05	0.1
2:35:20	15:35:07	26.95	27.1	0.15
2:52:31	15:52:18	26.86	27	0.14

Well B-4 Product Bail-Down Test Results

	Time	Depth to Product	Depth to Water	Product Thickness
3:12:01	16:11:48	26.84	26.99	0.15
3:31:20	16:31:07	26.82	26.98	0.16
3:56:16	16:56:03	26.81	26.98	0.17
4:14:11	17:13:58	26.8	26.98	0.18

Client:	Solutia, Inc.	Date:	1/6/99
Facility:	Solutia, Inc.	Project No.:	97026
	Nitro Plant	Field Staff:	S. Sharp, D. Stottlemyer
	LNAPL Area	Test Well:	B-4

SUMMARY OF TEST DATA - BAILDOWN TEST

MW DATA:

Test Well I.D.	B-4	Dia. of Well:	2", PVC
Initial DTW (ft):	28.00	Date/Time:	1/6/98/1245
Initial DTP (ft):	26.50		
Equipment:	Solinst Interface Probe		

EVACUATION SUMMARY:

Total Volume Fluid Removed: 2.0 gal.
Vol. Product Removed: 1.0 gal.
Vol. Water Removed: 1.0 gal.
Evacuation Method: Bailer

LEGEND:

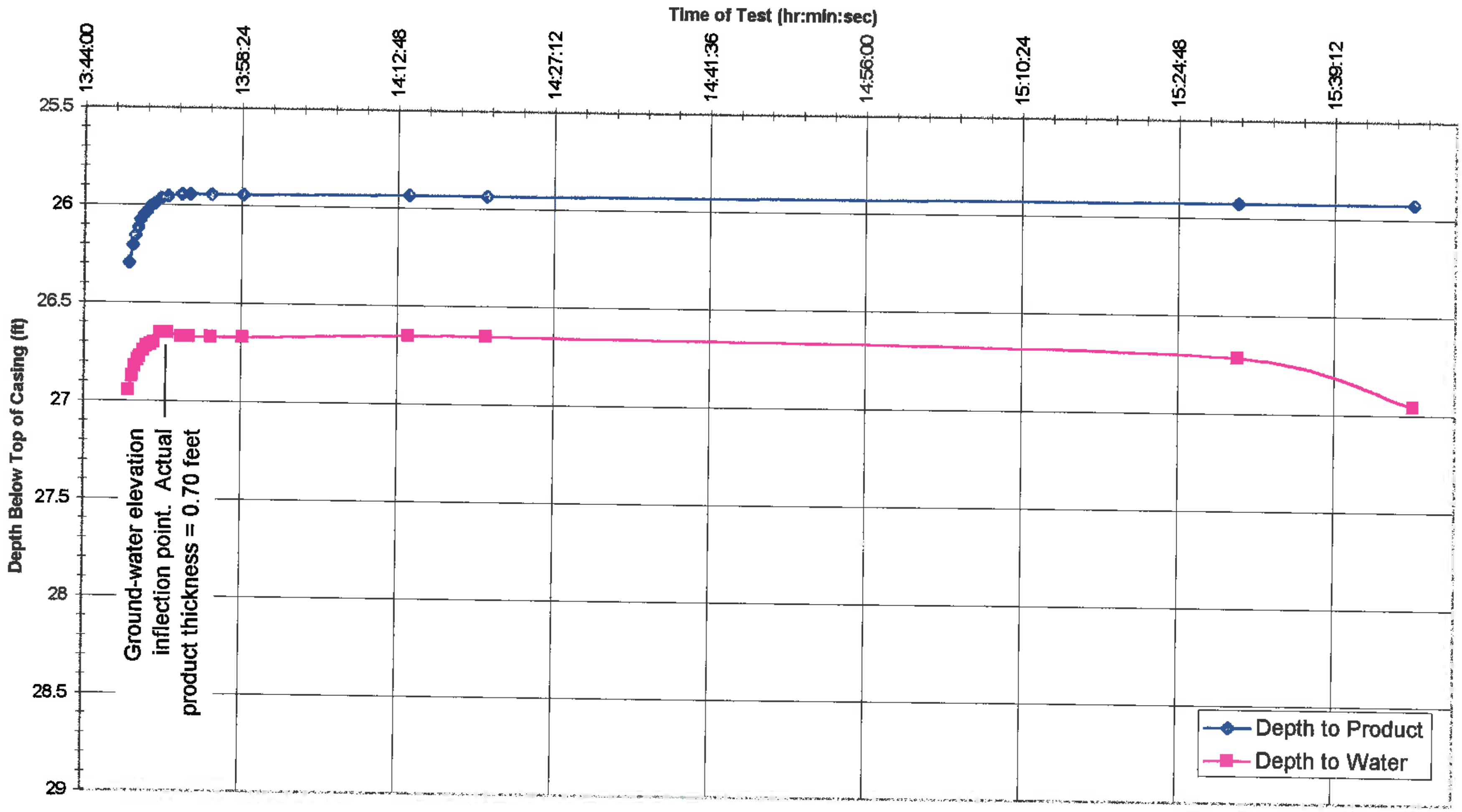
Drawdown (H) = DTW_t - DTW_0; DTW = Depth to Water; DTP = Depth to Product

** Continue Recharge Measurements until H/H_0 = 0.37

Measurement	(Time)- Elapsed Time	DTP (ft)	DTW (ft)	Drawdown (H) (ft)	H/H_0
1	(12:59' 47")	31.38	31.28	3.28	1.000
2	0:00:08	31.11	31.14	3.14	0.957
3	0:00:40	30.80	30.92	2.92	0.890
4	0:01:13	30.55	30.90	2.90	0.884
5	0:01:45	30.32	30.50	2.50	0.762
6	0:02:08	30.18	30.36	2.36	0.720
7	0:02:41	30.09	30.20	2.20	0.671
8	0:03:09	29.84	30.10	2.10	0.640
9	0:03:25	29.70	29.99	1.99	0.607
10	0:04:03	29.50	29.82	1.82	0.555
11	0:04:18	29.41	29.73	1.73	0.527
12	0:04:42	29.21	29.61	1.61	0.491
13	0:05:04	29.17	29.52	1.52	0.463
14	0:05:23	29.06	29.43	1.43	0.436
15	0:05:47	28.95	29.31	1.31	0.399
16	0:06:13	28.83	29.22	1.22	0.372
17	0:06:23	28.73	29.12	1.12	0.341
18	0:07:01	28.63	29.05	1.05	0.320
19	0:07:26	28.54	28.96	0.96	0.293
20	0:07:48	28.46	28.90	0.90	0.274
21	0:08:01	28.41	28.84	0.84	0.256
22	0:08:20	28.35	28.80	0.80	0.244
23	0:08:39	28.29	28.72	0.72	0.220
24	0:09:14	28.12	28.66	0.66	0.201
25	0:09:40	28.10	28.60	0.60	0.183
26	0:10:02	28.04	28.55	0.55	0.168

Measurement	(Time)- Elapsed Time	DTP (ft)	DTW (ft)	Drawdown (H) (ft)	H/H_0
27	0:10:29	27.98	28.51	0.51	0.155
28	0:10:46	27.93	28.47	0.47	0.143
29	0:11:19	27.85	28.42	0.42	0.128
30	0:11:45	27.80	28.38	0.38	0.116
31	0:12:08	27.75	28.34	0.34	0.104
32	0:12:35	27.70	28.31	0.31	0.095
33	0:13:08	27.65	28.26	0.26	0.079
34	0:13:40	27.60	28.22	0.22	0.067
35	0:14:20	27.55	28.18	0.18	0.055
36	0:15:08	27.50	28.10	0.10	0.030
37	0:16:00	27.45	28.05	0.05	0.015
38	0:16:59	27.40	27.99	-0.01	-0.003
39	0:18:16	27.35	27.92	-0.08	-0.024
40	0:20:05	27.30	27.81	-0.19	-0.058
41	0:22:10	27.25	27.72	-0.28	-0.085
42	0:24:25	27.20	27.61	-0.39	-0.119
43	0:28:31	27.17	27.47	-0.53	-0.162
44	0:31:29	27.12	27.39	-0.61	-0.186
45	1:43:05	27.05	27.20	-0.80	-0.244
46	1:49:09	27.01	27.14	-0.86	-0.262
47	1:55:00	26.99	27.11	-0.89	-0.271
48	1:59:46	26.97	27.08	-0.92	-0.280
49	2:06:07	26.95	27.05	-0.95	-0.290
50	2:35:20	26.95	27.10	-0.90	-0.274
51	2:52:31	26.86	27.00	-1.00	-0.305
52	3:12:01	26.84	26.99	-1.01	-0.308
53	3:31:20	26.82	26.98	-1.02	-0.311
54	3:56:16	26.81	26.98	-1.02	-0.311
55	4:14:11	26.80	26.98	-1.02	-0.311

LNAPL Recovery Area
Well R-2 Baildown Test Results



ROUX ASSOCIATES INC

MO06619J08.56

Well R-2 Product Bail-Down Test Results

	Time	Depth to Product	Depth to Water	Product Thickness
13:48:05	13:48:05	26.29	26.94	0.65
0:00:21	13:48:26	26.2	26.87	0.67
0:00:36	13:48:41	26.15	26.82	0.67
0:00:50	13:48:55	26.11	26.79	0.68
0:01:04	13:49:09	26.07	26.77	0.7
0:01:23	13:49:28	26.04	26.74	0.7
0:01:40	13:49:45	26.03	26.72	0.69
0:02:01	13:50:06	26	26.71	0.71
0:02:19	13:50:24	25.99	26.7	0.71
0:02:57	13:51:02	25.96	26.65	0.69
0:03:34	13:51:39	25.95	26.65	0.7
0:04:50	13:52:55	25.94	26.67	0.73
0:05:37	13:53:42	25.94	26.67	0.73
0:07:35	13:55:40	25.94	26.67	0.73
0:10:30	13:58:35	25.94	26.67	0.73
0:25:45	14:13:50	25.93	26.65	0.72
0:32:53	14:20:58	25.93	26.65	0.72
1:42:12	15:30:17	25.92	26.71	0.79
1:58:25	15:46:30	25.92	26.95	1.03

Client:	Solutia, Inc.	Date:	1/7/99
Facility:	Solutia, Inc.	Project No.:	97026
	Nitro Plant	Field Staff:	C. Henderson, D. Stottlemyer
	LNAPL Area	Test Well:	R-2

SUMMARY OF TEST DATA - BAILDOWN TEST

MW DATA:

Test Well I.D.	R-2	Dia. of Well:	4", PVC
Initial DTW (ft):	27.32	Date/Time:	1-7-99/1338
Initial DTP (ft):	25.75		
Equipment:	Solinst Interface Probe		

EVACUATION SUMMARY:

Total Volume Fluid Removed: 4.5 gal.
Vol. Product Removed: 1.2 gal.
Vol. Water Removed: 3.3 gal.
Evacuation Method: Bailer

LEGEND:

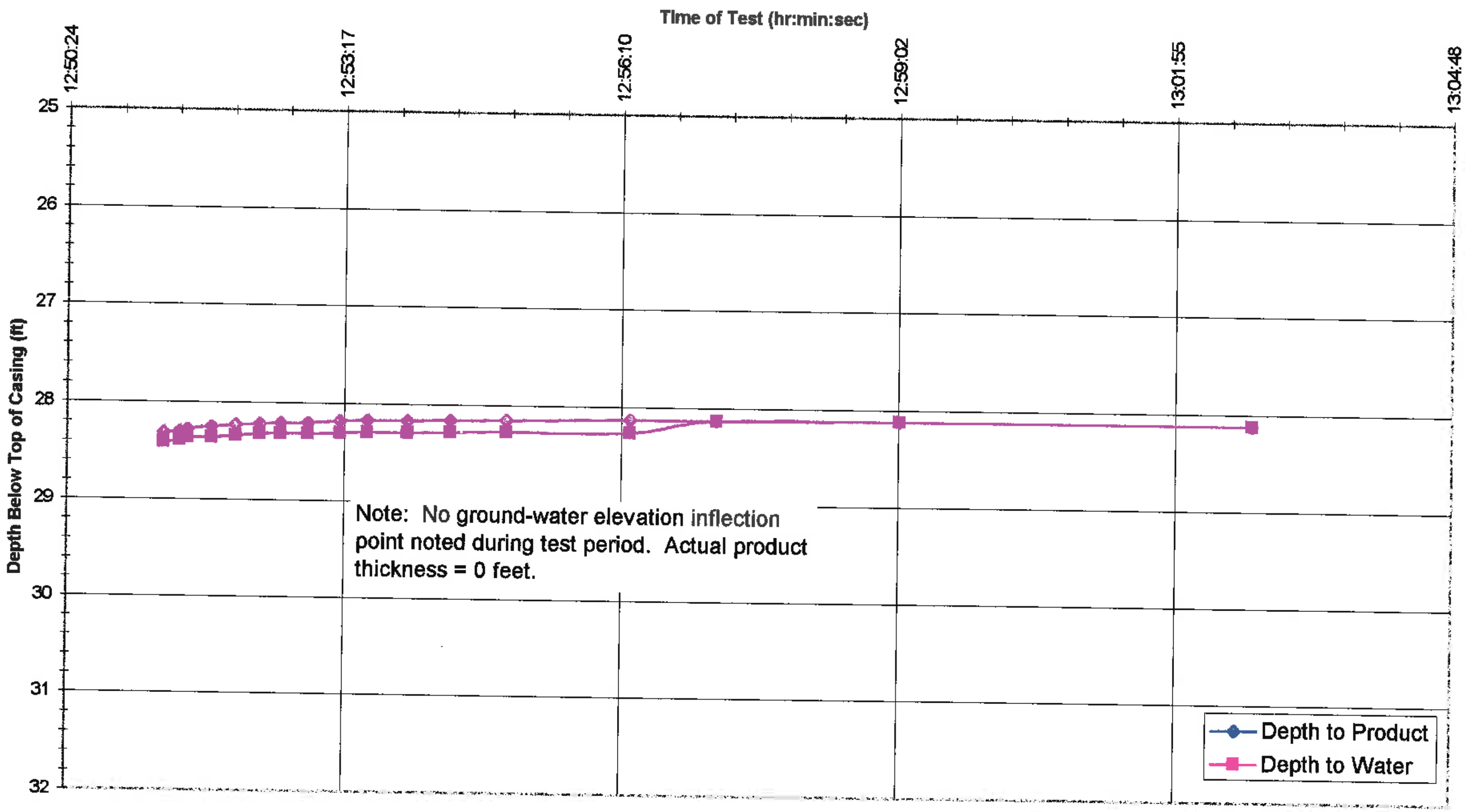
Drawdown (H) = DTW_t - DTW_0; DTW = Depth to Water; DTP = Depth to Product

** Continue Recharge Measurements until H/H_0 = 0.37

Measurement	(Time)- Elapsed Time	DTP (ft)	DTW (ft)	Drawdown (H) (ft)	H/H_0
1	(13 hr 48' 05")	26.29	26.94	-0.38	1.000
2	0:00:21	26.20	26.87	-0.45	1.184
3	0:00:36	26.15	26.82	-0.50	1.316
4	0:00:50	26.11	26.79	-0.53	1.395
5	0:01:04	26.07	26.77	-0.55	1.447
6	0:01:23	26.04	26.74	-0.58	1.526
7	0:01:40	26.03	26.72	-0.60	1.579
8	0:02:01	26.00	26.71	-0.61	1.605
9	0:02:19	25.99	26.70	-0.62	1.632
10	0:02:57	25.96	26.65	-0.67	1.763
11	0:03:34	25.95	26.65	-0.67	1.763
12	0:04:50	25.94	26.67	-0.65	1.711
13	0:05:37	25.94	26.67	-0.65	1.711
14	0:07:35	25.94	26.67	-0.65	1.711
15	0:10:30	25.94	26.67	-0.65	1.711
16	0:25:45	25.93	26.65	-0.67	1.763
17	0:32:53	25.93	26.65	-0.67	1.763
18	1:42:12	25.92	26.71	-0.61	1.605
19	1:58:25	25.92	26.95	-0.37	0.974

Potesta Associates, Inc.
2300 MacCorkle Ave, SE
Charleston, WV 25304

LNAPL Recovery Area
Well W-1 Baildown Test Results



ROUX ASSOCIATES INC

MO06619J08.56

Well W-1 Product Bail-Down Test Results

	Time	Depth to Product	Depth to Water	Product Thickness
12:51:24	12:51:24	28.3	28.4	0.1
0:00:10	12:51:34	28.29	28.38	0.09
0:00:15	12:51:39	28.27	28.35	0.08
0:00:30	12:51:54	28.24	28.35	0.11
0:00:45	12:52:09	28.22	28.33	0.11
0:01:00	12:52:24	28.21	28.31	0.1
0:01:13	12:52:37	28.2	28.3	0.1
0:01:30	12:52:54	28.19	28.3	0.11
0:01:50	12:53:14	28.17	28.29	0.12
0:02:07	12:53:31	28.16	28.28	0.12
0:02:32	12:53:56	28.16	28.28	0.12
0:02:59	12:54:23	28.15	28.27	0.12
0:03:34	12:54:58	28.14	28.26	0.12
0:04:51	12:56:15	28.12	28.25	0.13
0:05:45	12:57:09	28.12	28.12	0
0:07:39	12:59:03	28.11	28.11	0
0:11:19	13:02:43	28.11	28.11	0

Client:	Solutia, Inc.	Date:	1/7/99
Facility:	Solutia, Inc.	Project No.:	97026
	Nitro Plant	Field Staff:	C. Henderson, D. Stottlemyer
	LNAPL Area	Test Well:	W-1

SUMMARY OF TEST DATA - BAILDOWN TEST

MW DATA:

Test Well I.D.	W-1	Dia. of Well:	8", Steel
Initial DTW (ft):	28.28	Date/Time:	1-7-99/1240
Initial DTP (ft):	28.10		
Equipment:	Solinst Interface Probe		

EVACUATION SUMMARY:

Total Volume Fluid Removed:	5.0	gal.
Vol. Product Removed:	1.0	gal.
Vol. Water Removed:	4.0	gal.
Evacuation Method	Bailer	

LEGEND:

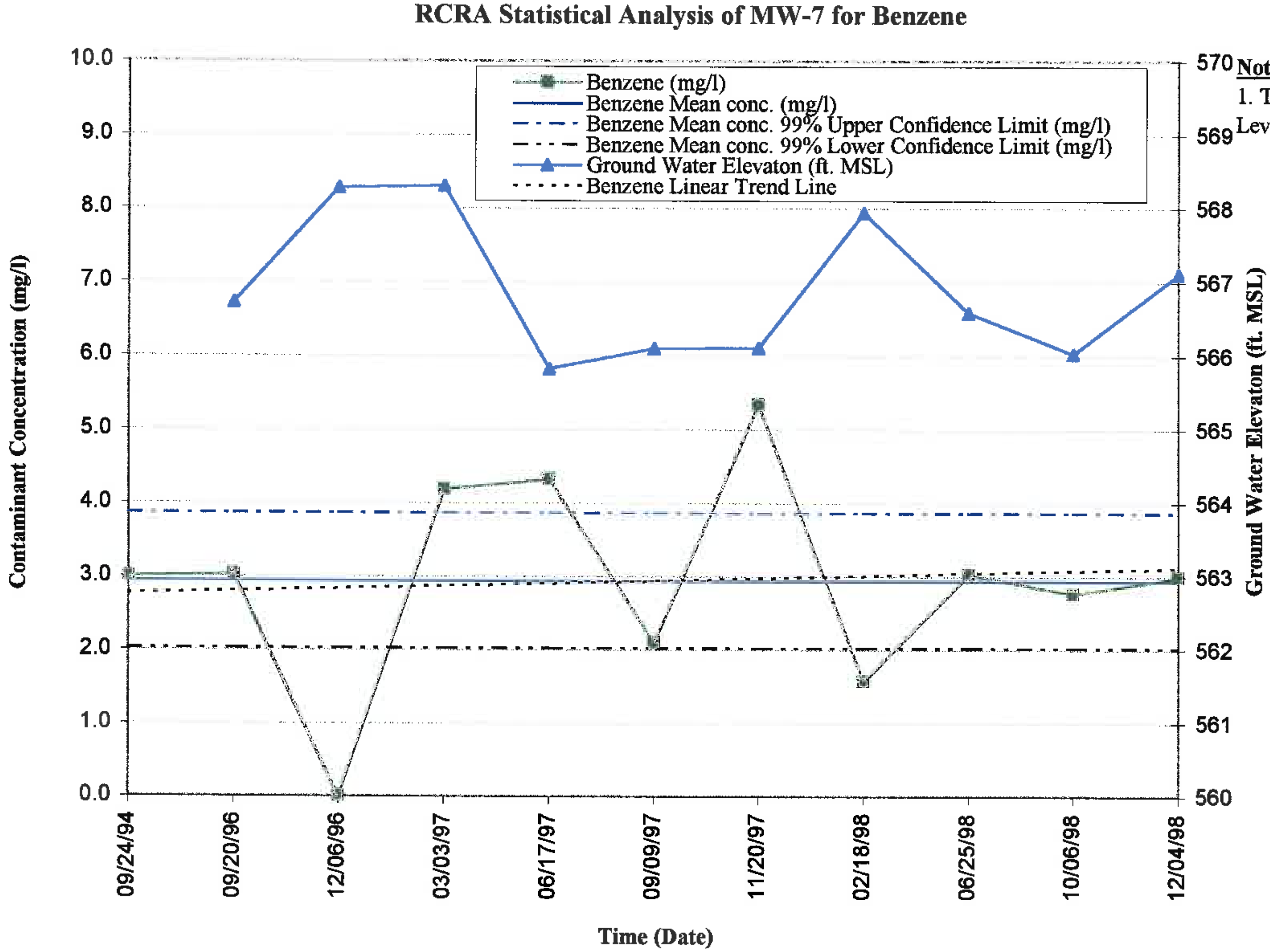
Drawdown (H) = DTW_t - DTW_0; DTW = Depth to Water; DTP = Depth to Product

** Continue Recharge Measurements until H/H_0 = 0.37

Measurement	(Time)- Elapsed Time	DTP (ft)	DTW (ft)	Drawdown (H) (ft)	H/H_0
1	12:51:24	28.30	28.40	0.12	1.000
2	0:00:10	28.29	28.38	0.10	0.833
3	0:00:15	28.27	28.35	0.07	0.583
4	0:00:30	28.24	28.35	0.07	0.583
5	0:00:45	28.22	28.33	0.05	0.417
6	0:01:00	28.21	28.31	0.03	0.250
7	0:01:13	28.20	28.30	0.02	0.167
8	0:01:30	28.19	28.30	0.02	0.167
9	0:01:50	28.17	28.29	0.01	0.083
10	0:02:07	28.16	28.28	0.00	0.000
11	0:02:32	28.16	28.28	0.00	0.000
12	0:02:59	28.15	28.27	-0.01	-0.083
13	0:03:34	28.14	28.26	-0.02	-0.167
14	0:04:51	28.12	28.25	-0.03	-0.250
15	0:05:45	28.12	28.12	-0.16	-1.333
16	0:07:39	28.11	28.11	-0.17	-1.417
17	0:11:19	28.11	28.11	-0.17	-1.417

APPENDIX F

Past Disposal Area
Monitoring Well Trend Graphs



Notes:

1. The Benzene Permit Level is 0.005 mg/l.

RCRA Statistical Analysis of MW-7 for Benzene

Date	Benzene (mg/l)	Benzene Mean conc. (mg/l)	Benzene Mean conc. 99% Upper Confidence Limit (mg/l)	Benzene Mean conc. 99% Lower Confidence Limit (mg/l)	Ground Water Elevaton (ft. MSL)
09/24/94	3.00	2.9418	3.8625	2.0211	
09/20/96	3.03	2.9418	3.8625	2.0211	566.72
12/06/96	ND	2.9418	3.8625	2.0211	568.28
03/03/97	4.19	2.9418	3.8625	2.0211	568.31
06/17/97	4.33	2.9418	3.8625	2.0211	565.83
09/09/97	2.10	2.9418	3.8625	2.0211	566.11
11/20/97	5.34	2.9418	3.8625	2.0211	566.12
02/18/98	1.58	2.9418	3.8625	2.0211	567.94
06/25/98	3.03	2.9418	3.8625	2.0211	566.59
10/06/98	2.77	2.9418	3.8625	2.0211	566.04
12/04/98	2.99	2.9418	3.8625	2.0211	567.12

Abbreviations:

mg/l = milligrams per liter

Statistical Calculations:

Mean, x= 2.941818 mg/l

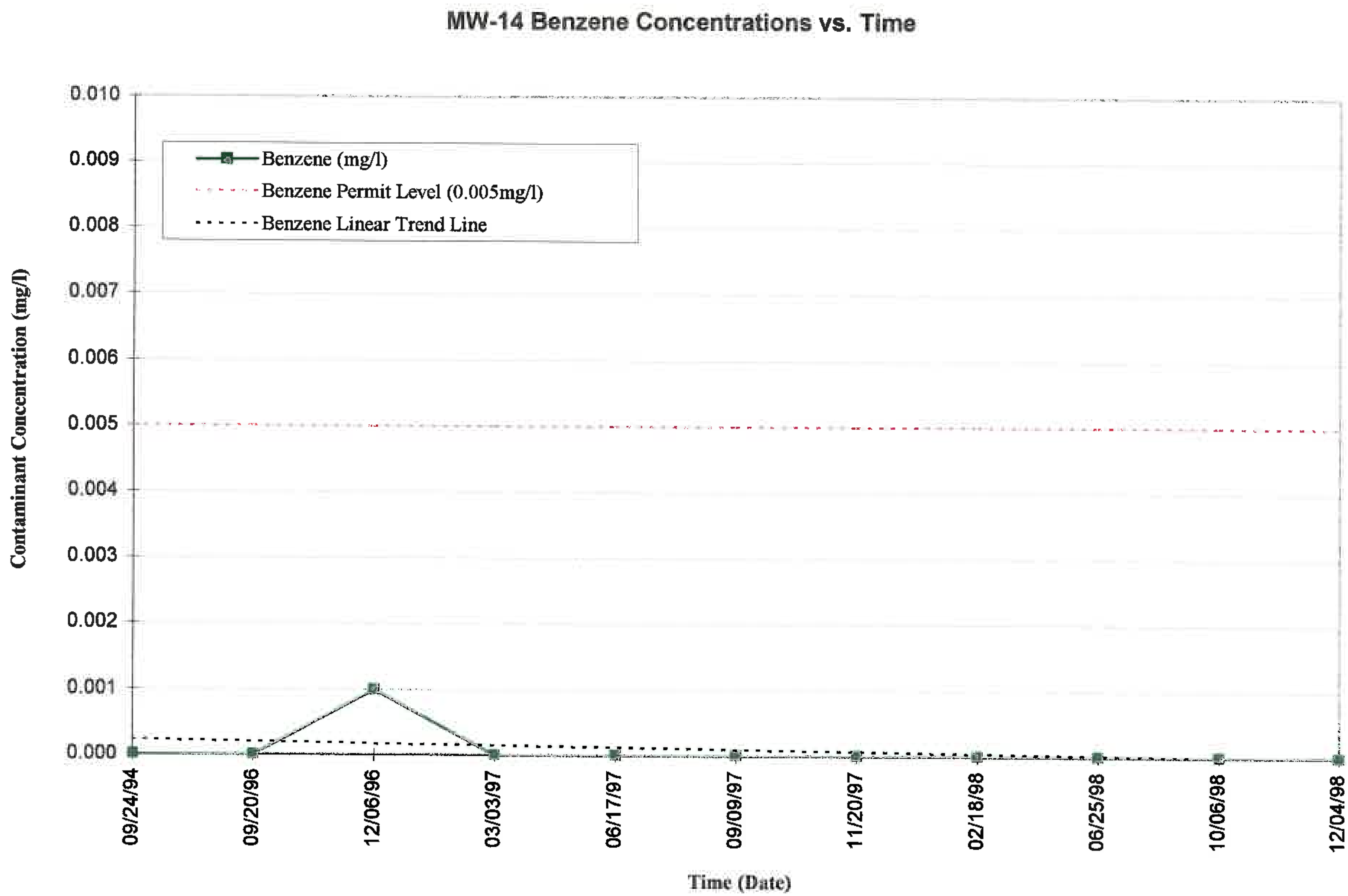
Standard Deviation, s= 1.104779515 mg/l

Degrees of Freedom = 10

t Distribution, t0.99 = 2.764

Confidence Interval (upper limit)= 3.86252 mg/l

Confidence Interval (lower limit)= 2.02112 mg/l


MW-14 Benzene Concentrations vs. Time
0.010
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0.000
Benzene (mg/l)
Benzene Permit Level (0.005mg/l)
Benzene Linear Trend Line
Contaminant Concentration (mg/l)
09/24/94
09/20/96
12/06/96
03/03/97
06/17/97
09/09/97
11/20/97
02/18/98
06/25/98
10/06/98
12/04/98
Time (Date)

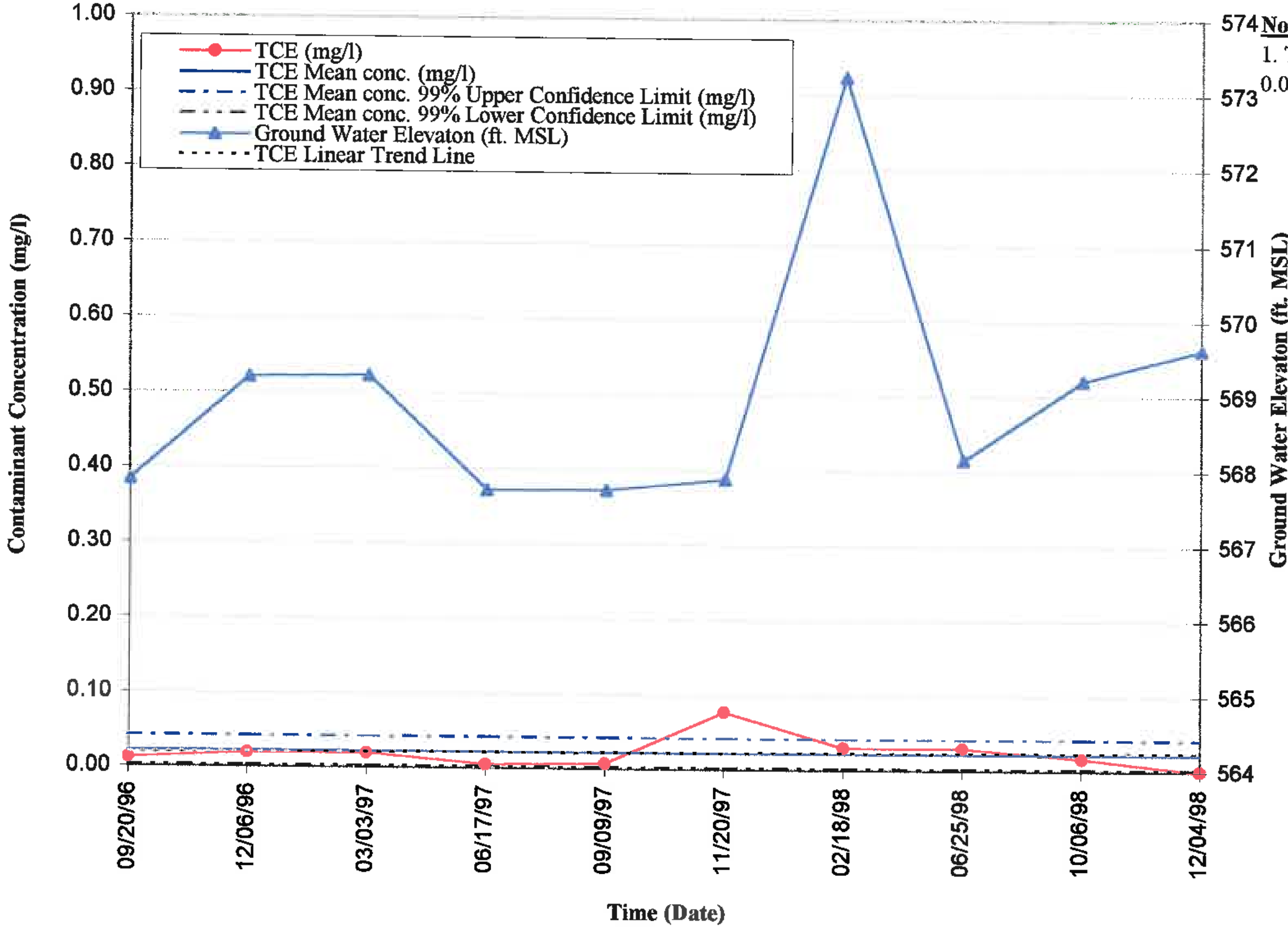
Summary of Ground-Water Elevations and Benzene Concentrations for MW-14

Date	Benzene (mg/l)	Benzene Permit Level (0.005mg/l)	Ground-Water Elevation (ft.MSL)
09/24/94	ND	0.005	--
09/20/96	ND	0.005	574.10
12/06/96	0.001	0.005	574.35
03/03/97	ND	0.005	574.27
06/17/97	ND	0.005	573.79
09/09/97	ND	0.005	573.84
11/20/97	ND	0.005	573.19
02/18/98	ND	0.005	573.10
06/25/98	ND	0.005	573.86
10/06/98	ND	0.005	573.24
12/04/98	ND	0.005	572.90

Abbreviations:

ft.MSL = feet above Mean Sea Level
mg/l = milligrams per liter

RCRA Statistical Analysis of MW-22R for Trichloroethene



Notes:

1. The TCE Permit Level is 0.005 mg/l.

ROUX ASSOCIATES INC

Mo190056.APP F.xls

RCRA Statistical Analysis of MW-22R for Trichloroethene

Date	TCE (mg/l)	TCE Mean conc. (mg/l)	TCE Mean conc. 99% Upper Confidence Limit (mg/l)	TCE Mean conc. 99% Lower Confidence Limit (mg/l)	Ground Water Elevaton (ft. MSL)
09/20/96	0.012	0.022	0.041	0.002	567.85
12/06/96	0.019	0.022	0.041	0.002	569.21
03/03/97	0.019	0.022	0.041	0.002	569.23
06/17/97	0.005	0.022	0.041	0.002	567.72
09/09/97	0.007	0.022	0.041	0.002	567.73
11/20/97	0.077	0.022	0.041	0.002	567.88
02/18/98	0.030	0.022	0.041	0.002	573.24
06/25/98	0.030	0.022	0.041	0.002	568.15
10/06/98	0.017	0.022	0.041	0.002	569.21
12/04/98	ND	0.022	0.041	0.002	569.63

Abbreviations:

mg/l = milligrams per liter

Statistical Calculations:

Mean, x= 0.021600 mg/l

Standard Deviation, s= 0.021719807 mg/l

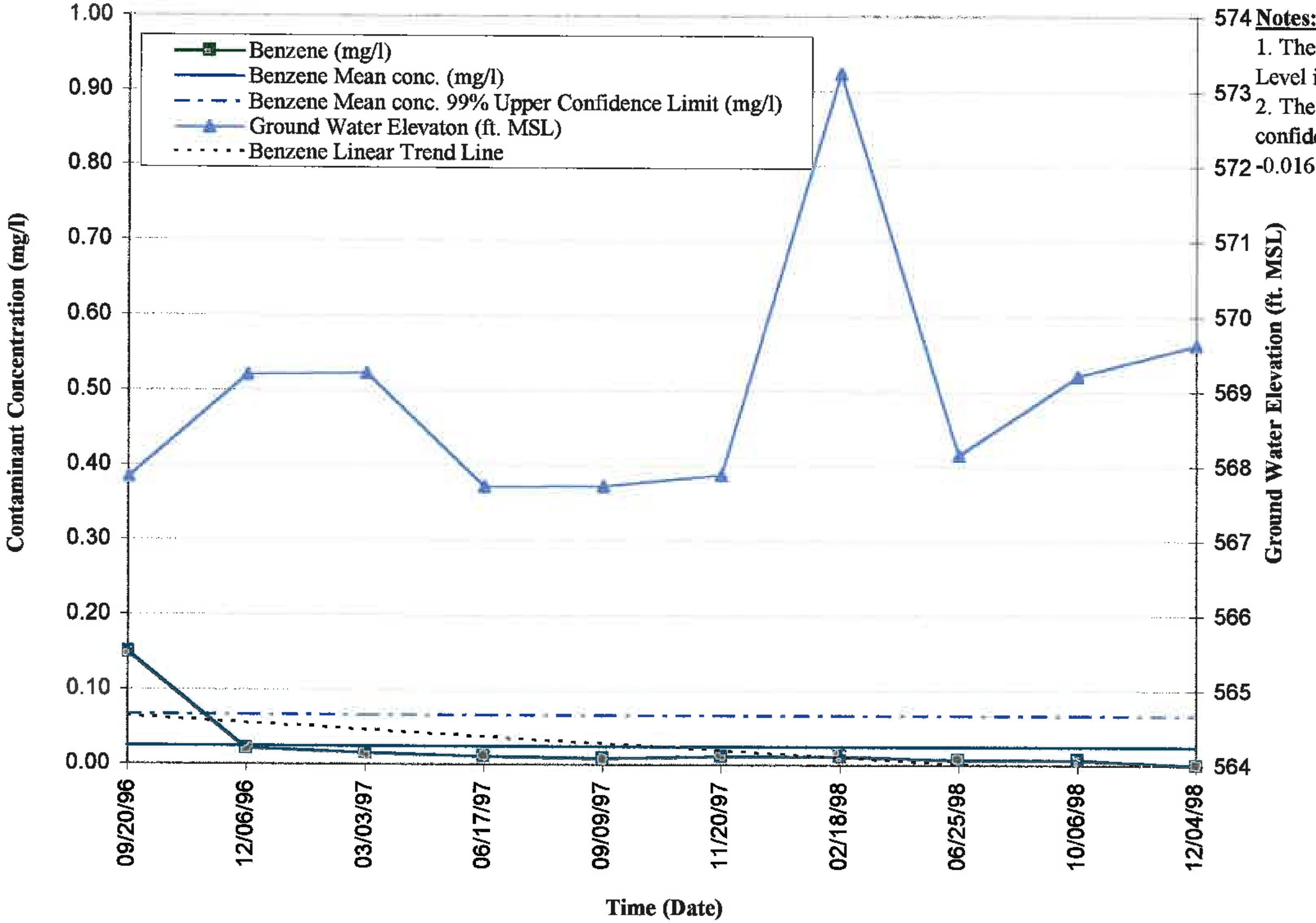
Degrees of Freedom = 9

t Distribution, t0.99 = 2.821

Confidence Interval (upper limit)= 0.04098 mg/l

Confidence Interval (lower limit)= 0.00222 mg/l

RCRA Statistical Analysis of MW-22R for Benzene



Notes:
1. The Benzene Permit Level is 0.005 mg/l.
2. The lower 99% confidence interval is -0.0169 mg/l.

RCRA Statistical Analysis of MW-22R for Benzene

Date	Benzene (mg/l)	Benzene Mean conc. (mg/l)	Benzene Mean conc. 99% Upper Confidence Limit (mg/l)	Benzene Mean conc. 99% Lower Confidence Limit (mg/l)	Ground Water Elevaton (ft. MSL)
09/20/96	0.150	0.0244	0.0657	-0.0169	567.85
12/06/96	0.021	0.0244	0.0657	-0.0169	569.21
03/03/97	0.015	0.0244	0.0657	-0.0169	569.23
06/17/97	0.011	0.0244	0.0657	-0.0169	567.72
09/09/97	0.009	0.0244	0.0657	-0.0169	567.73
11/20/97	0.012	0.0244	0.0657	-0.0169	567.88
02/18/98	0.012	0.0244	0.0657	-0.0169	573.24
06/25/98	0.007	0.0244	0.0657	-0.0169	568.15
10/06/98	0.007	0.0244	0.0657	-0.0169	569.21
12/04/98	ND	0.0244	0.0657	-0.0169	569.63

Abbreviations:

mg/l = milligrams per liter

Statistical Calculations:

Mean, x= 0.024400 mg/l

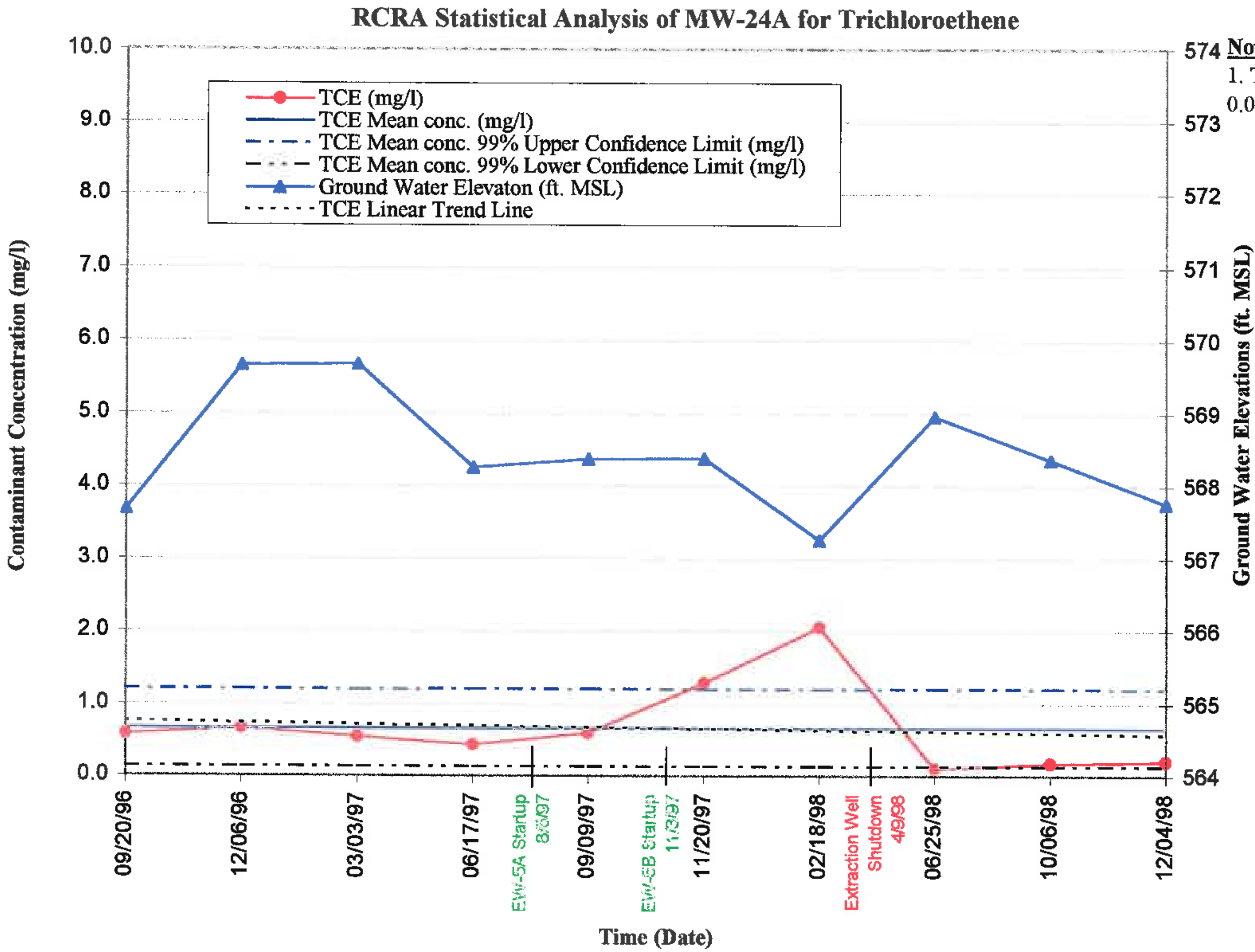
Standard Deviation, s= 0.046285647 mg/l

Degrees of Freedom = 9

t Distribution, t0.99 = 2.821

Confidence Interval (upper limit)= 0.06569 mg/l

Confidence Interval (lower limit)= -0.01689 mg/l



Notes:

1. The TCE Permit Level is 0.005 mg/l.

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RCRA Statistical Analysis of MW-24A for Trichloroethene

Date	TCE (mg/l)	TCE Mean conc. (mg/l)	TCE Mean conc. 99% Upper Confidence Limit (mg/l)	TCE Mean conc. 99% Lower Confidence Limit (mg/l)	Ground Water Elevaton (ft. MSL)
09/20/96	0.568	0.6611	1.1932	0.1290	567.68
12/06/96	0.657	0.6611	1.1932	0.1290	569.66
03/03/97	0.543	0.6611	1.1932	0.1290	569.68
06/17/97	0.431	0.6611	1.1932	0.1290	568.26
09/09/97	0.593	0.6611	1.1932	0.1290	568.37
11/20/97	1.290	0.6611	1.1932	0.1290	568.38
02/18/98	2.060	0.6611	1.1932	0.1290	567.26
06/25/98	0.102	0.6611	1.1932	0.1290	568.96
10/06/98	0.167	0.6611	1.1932	0.1290	568.36
12/04/98	0.200	0.6611	1.1932	0.1290	567.76

Abbreviations:

mg/l = milligrams per liter

Statistical Calculations:

Mean, x= 0.661100
mg/l

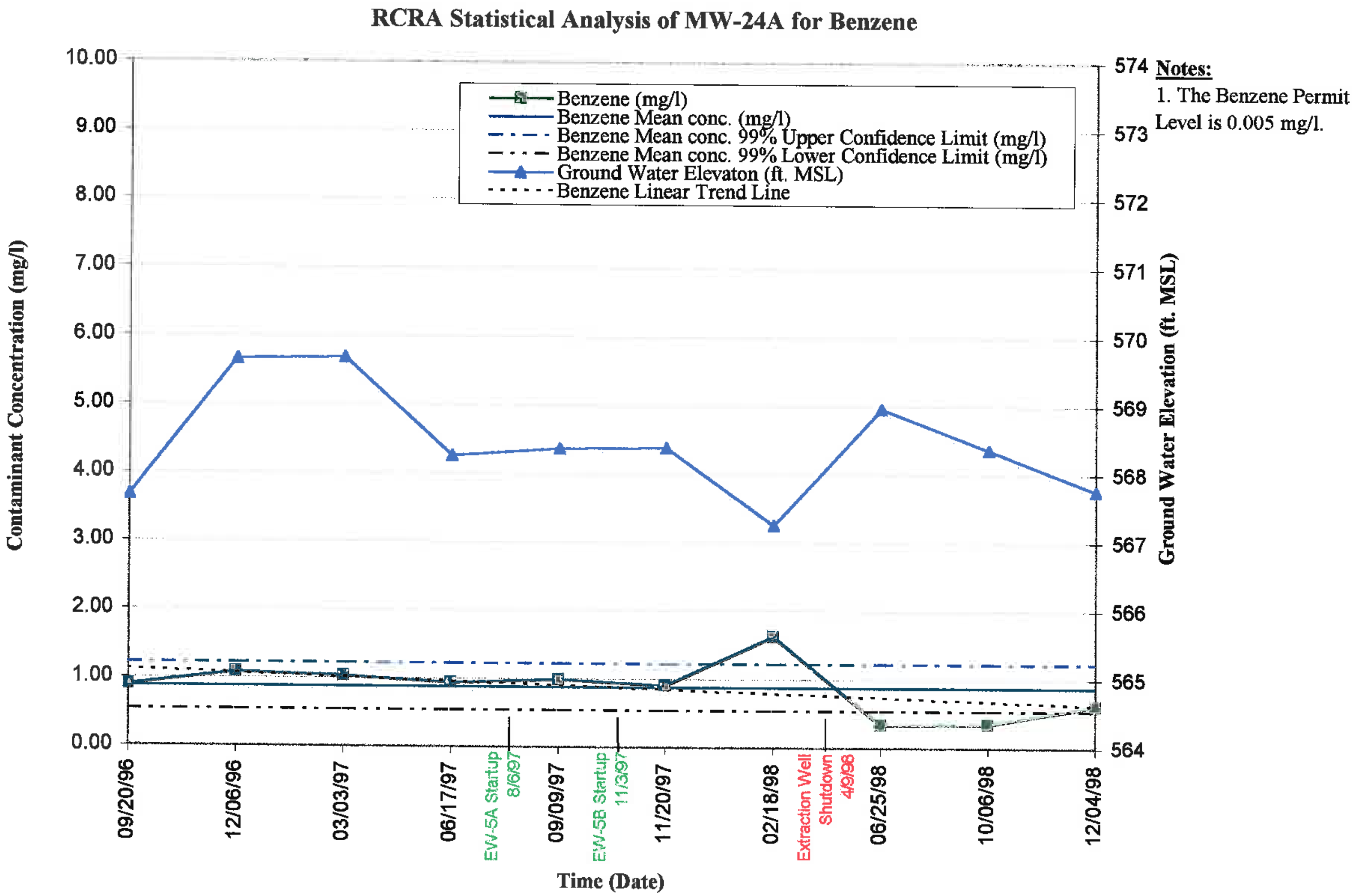
Standard Deviation, s= 0.596470443
mg/l

Degrees of Freedom = 9

t Distribution, t0.99 = 2.821

Confidence Interval (upper limit)= 1.19320
mg/l

Confidence Interval (lower limit)= 0.12900
mg/l



ROUX ASSOCIATES INC

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RCRA Statistical Analysis of MW-24A for Benzene

Date	Benzene (mg/l)	Benzene Mean conc. (mg/l)	Benzene Mean conc. 99% Upper Confidence Limit (mg/l)	Benzene Mean conc. 99% Lower Confidence Limit (mg/l)	Ground Water Elevaton (ft. MSL)
09/20/96	0.894	0.8763	1.2108	0.5418	567.68
12/06/96	1.080	0.8763	1.2108	0.5418	569.66
03/03/97	1.030	0.8763	1.2108	0.5418	569.68
06/17/97	0.934	0.8763	1.2108	0.5418	568.26
09/09/97	0.987	0.8763	1.2108	0.5418	568.37
11/20/97	0.909	0.8763	1.2108	0.5418	568.38
02/18/98	1.620	0.8763	1.2108	0.5418	567.26
06/25/98	0.342	0.8763	1.2108	0.5418	568.96
10/06/98	0.349	0.8763	1.2108	0.5418	568.36
12/04/98	0.618	0.8763	1.2108	0.5418	567.76

Abbreviations:

mg/l = milligrams per liter

Statistical Calculations:

Mean, x= 0.876300 mg/l

Standard Deviation, s= 0.374968754 mg/l

Degrees of Freedom = 9

t Distribution, t0.99 = 2.821

Confidence Interval (upper limit)= 1.21080 mg/l

Confidence Interval (lower limit)= 0.54180 mg/l

APPENDIX G

TCE Hot Spot Area
Field Operations Monitoring Log

TCE Hot Spot Area Field Operations Monitoring Long. Solutia Nitro, West Virginia.

Extraction Well *EW-5A*

Date	Status	Meter Reading (Gallons)	Comments
8/6/97	ON	0	
3/14/98	OFF	78,484	
3/26/98	OFF	78,490	Flow Meter Down
3/30/98	ON	81,460	Replaced Flow Meter
4/2/98	ON	83,218	
4/6/98	ON	84,470	Flow Meter Not Operating, To be Replaced
4/7/98	ON	85,374	
4/9/98	ON	87,168	Changed Meter Old reading 87,168, New Reading 74
4/9/98	OFF	87,452	Turned All Pumps Off, Meter Reading Is The Total Gallons Pumped From The Extraction Well
12/28/98	OFF		
1/8/99	ON		

Extraction Well *EW-5B*

Date	Status	Meter Reading (Gallons)	Comments
11/3/97	ON	0	
3/14/98	OFF	200,832	
3/26/98	ON	258,955	
3/30/98	ON	353,445	
4/2/98	ON	426,705	
4/6/98	ON	510,680	
4/7/98	ON	531,910	
4/9/98	ON	572,628	
4/9/98	OFF	575,395	Turned All Pumps Off, Meter Reading Is The Total Gallons Pumped From The Extraction Well
12/28/98	ON	575,412	Restarted pumping
1/8/99	ON		

Extraction Well *EW-6A*

Date	Status	Meter Reading (Gallons)	Comments
5/9/97	ON	0	
3/14/98	ON	172,810	
3/26/98	OFF	195,931	
3/30/98	IDLE	208,930	
4/2/98	IDLE	218,545	Closed Valve 1/4 Turn
4/6/98	IDLE	228,910	Closed Valve 1/2
4/7/98	IDLE	232,023	
4/9/98	OFF	232,767	
4/9/98	OFF	232,767	Turned All Pumps Off, Meter Reading Is The Total Gallons Pumped From The Extraction Well
12/15/98	OFF	232,766	
1/8/99	ON		Restarted pumping

Note: Idle status indicates well is operational and was shut off by the low well water level switch at the time the system was monitored.

TCE Hot Spot Area Field Operations Monitoring Long. Solutia Nitro, West Virginia.

Extraction Well ***EW-6B***

Date	Status	Meter Reading (Gallons)	Comments
7/23/97	ON	0	
3/14/98	ON	2,173,178	
3/26/98	ON	2,308,445	
3/30/98	ON	2,348,495	
4/2/98	IDLE	2,379,546	
4/6/98	IDLE	2,414,000	Closed Valve 1/4 Turn, Need to Check Probes
4/7/98	ON	2,424,111	
4/9/98	OFF	2,426,534	
4/9/98	OFF	2,426,537	Turned All Pumps Off, Meter Reading Is The Total Gallons Pumped From The Extraction Well
12/15/98	OFF		Tested system
1/8/99	ON		

Extraction Well ***EW-7A***

Date	Status	Meter Reading (Gallons)	Comments
4/11/97	ON	0	
3/14/98	ON	101,890	
3/26/98	OFF	105,165	
3/30/98	IDLE	109,017	
4/2/98	IDLE	112,000	Closed Valve 1/4 Turn
4/6/98	IDLE	115,350	Closed Valve 1/2
4/7/98	IDLE	116,222	
4/9/98	IDLE	117,974	
4/9/98	OFF	117,652	Turned All Pumps Off, Meter Reading Is The Total Gallons Pumped From The Extraction Well
12/16/98	ON	117,650	Restarted pumping
12/22/98	ON	124,905	
12/28/98	ON	131,618	
1/8/99	ON		

Extraction Well ***EW-7B***

Date	Status	Meter Reading (Gallons)	Comments
3/19/97	ON	0	
4/2/98	ON	5,257,880	
4/6/98	ON	5,348,070	
4/7/98	ON	5,371,570	
4/9/98	ON	5,416,789	
4/9/98	OFF	5,418,879	Turned All Pumps Off, Meter Reading Is The Total Gallons Pumped From The Extraction Well
12/16/98	OFF	5,418,881	Restarted pumping
12/21/98	ON	5,418,881	Tested system
12/22/98	ON	5,428,235	Restarted pumping
12/28/98	ON	5,469,877	
1/8/99	ON		

Note: Idle status indicates well is operational and was shut off by the low well water level switch at the time the system was monitored.

TCE Hot Spot Area Field Operations Monitoring Long. Solutia Nitro, West Virginia.

Extraction Well *EW-8*

Date	Status	Meter Reading (Gallons)	Comments
2/13/97	ON	0	
3/19/97	ON	ND	
3/26/98	OFF	2,010	Replaced Meter
3/30/98	IDLE	2,860	
4/2/98	IDLE	3,565	
4/6/98	IDLE	4,340	Closed Valve 1/4 Turn
4/7/98	IDLE	4,560	Closed Valve 1/2
4/9/98	IDLE	4,963	
4/9/98	OFF	51,100	Turned All Pumps Off, Meter Reading Is The Total Gallons Pumped From The Extraction Well
12/28/98	ON	4,991	Restated pumping
1/8/99	ON		

APPENDIX H

TCE HOT SPOT AREA
EXTRACTION WELL MONITORING
LABORATORY DATA PACKAGES

TERRADON
P.O. Box 519
Nitro, WV 25143
(304) 755-8291
FAX 755-2636

Custody No. 2833

Date: 2-14-97

CHAIN-OF-CUSTODY RECORD

SAMPLE COLLECTION INFORMATION

Person to Contact: Dave Junker Telephone: 755-8291

Sampling Site: Monsanto TCE Extraction

Project #: 96X150 Sampler: Jeff Butler

Date of Sample Shipment: 2-14-97 How Shipped: Courier

SAMPLE LOG AND ANALYSES REQUEST

TURNAROUND REQUIREMENTS
____ Regular
____ Rush

Analysis Requested

Sample ID	Containers # and Type	Date	Time	Matrix	Grab / Comp.	TCE Benzene	Chlorobenzene	Phenols				Remarks
EW-5A	2-40 mil / 1-Glass Liter	2/13	930	Liq	Grab	X	X	X				
EW-5B	"	"	1030	"	"	X	X	X				
EW-6A	"	"	1130	"	"	X	X	X				
EW-6B	"	"	1315	"	"	X	X	X				
EW-7A	"	"	1410	"	"	X	X	X				
EW-8B	"	"	1505	"	"	X	X	X				
EW-8	"	"	1600	"	"	X	X	X				

Relinquished by (Signature)	Date/Time	Received by (Signature)	Relinquished by (Signature)	Date/Time	Received by (Signature)
David N. Junker	2/14 1240	[signature]			

Relinquished by (Signature)	Date/Time	Received for Laboratory by (Signature)	Date/Time	Condition on Arrival
[signature]	2/14 330	[signature]	2/14/97	@3:30 OK 4.4°C

Comments: Add o-cresol and m,p-cresol to Phenols list

Possible Interfering Compounds: ____

Requested by: David N. Junker

LAB I.D. NO. 49324

TERRADON SAMPLE #: EW-5A
REIC SAMPLE #: 49324-1

DATE SAMPLED: 02-13-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.036	mg/l	8240B	0.005	02-20-97/TC
trichloroethene	2.12	mg/l	8240B	0.005	02-20-97/TC
chlorobenzene	0.018	mg/l	8240B	0.005	02-20-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	106
toluene-d8	98
4-bromofluorobenzene	100

MQL - Minimum Quantifying Level

TERRADON SAMPLE #: EW-5A
REIC SAMPLE #: 49324-1

DATE SAMPLED: 02-13-97
MATRIX: LIQUID

SEMIVOLATILE ORGANIC COMPOUNDS - ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	02-19-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
o-cresol	ND	mg/l	8270B	0.020	02-19-97/WP
m,p-cresol	ND	mg/l	8270B	0.020	02-19-97/WP

Surrogates	% Recovery
2-fluorophenol	39
phenol-d6	11
2,4,6-tribromophenol	68

ND - None Detected at MQL
MQL - Minimum Quantifying Level

TERRADON SAMPLE #: **EW-5B** **DATE SAMPLED:** **02-13-97**
REIC SAMPLE #: **49324-2** **MATRIX:** **LIQUID**

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.030	mg/l	8240B	0.005	02-20-97/TC
trichloroethene	1.05	mg/l	8240B	0.005	02-20-97/TC
chlorobenzene	0.162	mg/l	8240B	0.005	02-20-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	111
toluene-d8	105
4-bromofluorobenzene	100

MQL - Minimum Quantifying Level

TERRADON SAMPLE #: EW-5B
REIC SAMPLE #: 49324-2

DATE SAMPLED: 02-13-97
MATRIX: LIQUID

SEMIVOLATILE ORGANIC COMPOUNDS - ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	02-19-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
o-cresol	ND	mg/l	8270B	0.020	02-19-97/WP
m,p-cresol	ND	mg/l	8270B	0.020	02-19-97/WP

Surrogates	% Recovery
2-fluorophenol	25
phenol-d6	14
2,4,6-tribromophenol	60

ND - None Detected at MQL
MQL - Minimum Quantifying Level

TERRADON SAMPLE #: EW-6A
REIC SAMPLE #: 49324-3

DATE SAMPLED: 02-13-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.010	mg/l	8240B	0.005	02-20-97/TC
trichloroethene	1.30	mg/l	8240B	0.005	02-20-97/TC
chlorobenzene	0.014	mg/l	8240B	0.005	02-20-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	105
toluene-d8	97
4-bromofluorobenzene	101

MQL - Minimum Quantifying Level

TERRADON SAMPLE #: EW-6A
REIC SAMPLE #: 49324-3

DATE SAMPLED: 02-13-97
MATRIX: LIQUID

SEMIVOLATILE ORGANIC COMPOUNDS - ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	02-19-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
o-cresol	ND	mg/l	8270B	0.020	02-19-97/WP
m,p-cresol	ND	mg/l	8270B	0.020	02-19-97/WP

Surrogates	% Recovery
2-fluorophenol	21
phenol-d6	11
2,4,6-tribromophenol	40

ND - None Detected at MQL
MQL - Minimum Quantifying Level

TERRADON SAMPLE #: **EW-6B** **DATE SAMPLED:** **02-13-97**
REIC SAMPLE #: **49324-4** **MATRIX:** **LIQUID**

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.041	mg/l	8240B	0.005	02-20-97/TC
trichloroethene	3.42	mg/l	8240B	0.005	02-20-97/TC
chlorobenzene	0.279	mg/l	8240B	0.005	02-20-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	104
toluene-d8	99
4-bromofluorobenzene	104

MQL - Minimum Quantifying Level

TERRADON SAMPLE #: EW-6B
REIC SAMPLE #: 49324-4

DATE SAMPLED: 02-13-97
MATRIX: LIQUID

SEMIVOLATILE ORGANIC COMPOUNDS - ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	02-19-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
o-cresol	ND	mg/l	8270B	0.020	02-19-97/WP
m,p-cresol	ND	mg/l	8270B	0.020	02-19-97/WP

Surrogates	% Recovery
2-fluorophenol	23
phenol-d6	11
2,4,6-tribromophenol	50

ND - None Detected at MQL
MQL - Minimum Quantifying Level

TERRADON SAMPLE #: **EW-7A** **DATE SAMPLED:** **02-13-97**
REIC SAMPLE #: **49324-5** **MATRIX:** **LIQUID**

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.032	mg/l	8240B	0.005	02-21-97/TC
trichloroethene	4.84	mg/l	8240B	0.005	02-21-97/TC
chlorobenzene	0.357	mg/l	8240B	0.005	02-21-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	108
toluene-d8	99
4-bromofluorobenzene	101

MQL - Minimum Quantifying Level

TERRADON SAMPLE #: EW-7A **DATE SAMPLED:** 02-13-97
REIC SAMPLE #: 49324-5 **MATRIX:** LIQUID

SEMIVOLATILE ORGANIC COMPOUNDS - ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	02-19-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
o-cresol	ND	mg/l	8270B	0.020	02-19-97/WP
m,p-cresol	0.058	mg/l	8270B	0.020	02-19-97/WP

Surrogates	% Recovery
2-fluorophenol	26
phenol-d6	15
2,4,6-tribromophenol	39

ND - None Detected at MQL
MQL - Minimum Quantifying Level

TERRADON SAMPLE #: EW-7B **DATE SAMPLED:** 02-13-97
REIC SAMPLE #: 49324-6 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.022	mg/l	8240B	0.005	02-20-97/TC
trichloroethene	4.00	mg/l	8240B	0.005	02-20-97/TC
chlorobenzene	0.029	mg/l	8240B	0.005	02-20-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	106
toluene-d8	98
4-bromofluorobenzene	103

MQL - Minimum Quantifying Level

TERRADON SAMPLE #: EW-7B
REIC SAMPLE #: 49324-6

DATE SAMPLED: 02-13-97
MATRIX: LIQUID

SEMIVOLATILE ORGANIC COMPOUNDS - ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	02-19-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
o-cresol	ND	mg/l	8270B	0.020	02-19-97/WP
m,p-cresol	ND	mg/l	8270B	0.020	02-19-97/WP

Surrogates	% Recovery
2-fluorophenol	25
phenol-d6	12
2,4,6-tribromophenol	42

ND - None Detected at MQL
MQL - Minimum Quantifying Level

TERRADON SAMPLE #: EW-8 **DATE SAMPLED:** 02-13-97
REIC SAMPLE #: 49324-7 **MATRIX:** LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.028	mg/l	8240B	0.005	02-20-97/TC
trichloroethene	1.30	mg/l	8240B	0.005	02-20-97/TC
chlorobenzene	ND	mg/l	8240B	0.005	02-20-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	106
toluene-d8	96
4-bromofluorobenzene	99

ND - None Detected at MQL
MQL - Minimum Quantifying Level

TERRADON SAMPLE #: **EW-8**
REIC SAMPLE #: **49324-7**

DATE SAMPLED: **02-13-97**
MATRIX: **LIQUID**

SEMIVOLATILE ORGANIC COMPOUNDS - ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	02-19-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	02-19-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	02-19-97/WP
o-cresol	ND	mg/l	8270B	0.020	02-19-97/WP
m,p-cresol	ND	mg/l	8270B	0.020	02-19-97/WP

Surrogates	% Recovery
2-fluorophenol	22
phenol-d6	25
2,4,6-tribromophenol	49

ND - None Detected at MQL
MQL - Minimum Quantifying Level

NEIC

CHAIN OF CUSTODY RECORD NO. 51 06

EIC Laboratory
225 Industrial Park Rd.
P.O. Box 286, Beaver, WV 25813
Phone: 304-255-2500 or 800-999-0105
FAX: 304-255-2572

CLIENT: MONSANTO CO.
ADDRESS: 1 MONSANTO ROAD
CITY/STATE/ZIP: NITRO WV
BILL TO: MONSANTO CO
CITY/STATE/ZIP: NITRO WV

CONTACT PERSON: CHRIS GROSE
TELEPHONE/FAX: (304) 357-4990/499
SITE ID & STATE: MONSANTO TCE WV
PROJECT ID: 97029
SAMPLER: D. STOTTLEMYER

SAMPLE LOG AND ANALYSIS REQUEST

TURNAROUND TIME REQUIREMENTS
REGULAR: X
*RUSH: ___ 5-Day ___ 3-Day ___ 2-Day ___ 1-Day
*Rush work needs prior Laboratory approval and will include surcharges

PRESERVATIVES
0 No Preservative
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide
6 Zinc Acetate
7 EDTA

NOTE PRESERVATIVES →
PRESERVATIVE CODES

ANALYSIS REQUESTED & METHOD

SAMPLE ID	NO. & TYPE OF CONTAINERS	SAMPLING DATE / TIME	MATRIX	SAMPLE COMP / GRAB	MOD. PRIORITY POLL, NO METALS NO DIOXIN	COMMENTS
EW-5A WELL	1-1L AMBER	8-6-97 1635	H_2O	GRAB	X	* FAX RESULTS
EW-5A WELL	2-40ml	8-6-97 1635	H_2O	GRAB	X	TO CHRIS GROSE
EW-5A MANHOLE	1-1L AMBER	8-6-97 1645	H_2O	GRAB	X	
EW-5A MANHOLE	2-40ml	8-6-97 1645	H_2O	GRAB	X	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
[signature]	8-6-97 1736	[signature]	8-7-97 7:30	[signature]	8-7-97 4:20	Angela Robertson	8-7-97 4:00

Special Requests:

Sample Condition: Good? Y N
Temperature Upon Arrival 4 °C

Shipment: Hand-Del: Courier: UPS: FedEx:
Shipment Date: FAX Results: Y N

MONSANTO SAMPLE #: EW-5A WELL **DATE SAMPLED:** 08-06-97
REIC SAMPLE #: 53806-1 **MATRIX:** LIQUID

PRIORITY POLLUTANT VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
acrolein	ND	mg/l	624	0.050	08-11-97/TC
acrylonitrile	ND	mg/l	624	0.050	08-11-97/TC
benzene	0.217	mg/l	624	0.005	08-11-97/TC
bromoform	ND	mg/l	624	0.005	08-11-97/TC
carbon tetrachloride	ND	mg/l	624	0.005	08-11-97/TC
chlorobenzene	0.089	mg/l	624	0.005	08-11-97/TC
chlorodibromomethane	ND	mg/l	624	0.005	08-11-97/TC
chloroethane	ND	mg/l	624	0.005	08-11-97/TC
2-chloroethyl vinyl ether	ND	mg/l	624	0.005	08-11-97/TC
chloroform	0.058	mg/l	624	0.005	08-11-97/TC
cis-1,3-dichloropropylene	ND	mg/l	624	0.005	08-11-97/TC
dichlorobromomethane	ND	mg/l	624	0.005	08-11-97/TC
1,1-dichloroethane	ND	mg/l	624	0.005	08-11-97/TC
1,2-dichloroethane	0.030	mg/l	624	0.005	08-11-97/TC
1,1-dichloroethylene	0.006	mg/l	624	0.005	08-11-97/TC
1,2-dichloropropane	ND	mg/l	624	0.005	08-11-97/TC
ethylbenzene	0.012	mg/l	624	0.005	08-11-97/TC
methyl bromide	ND	mg/l	624	0.005	08-11-97/TC
methyl chloride	ND	mg/l	624	0.005	08-11-97/TC
methylene chloride	ND	mg/l	624	0.005	08-11-97/TC
1,1,2,2-tetrachloroethane	ND	mg/l	624	0.005	08-11-97/TC
tetrachloroethylene	ND	mg/l	624	0.005	08-11-97/TC
toluene	0.044	mg/l	624	0.005	08-11-97/TC
trans-1,2-dichloroethylene	0.434	mg/l	624	0.005	08-11-97/TC
trans-1,3-dichloropropylene	0.489	mg/l	624	0.005	08-11-97/TC

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: **EW-5A WELL** **DATE SAMPLED:** **08-06-97**
REIC SAMPLE #: **53806-1** **MATRIX:** **LIQUID**

PRIORITY POLLUTANT
VOLATILE ORGANIC COMPOUNDS (continued)

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
1,1,1-trichloroethane	ND	mg/l	624	0.005	08-11-97/TC
1,1,2-trichloroethane	ND	mg/l	624	0.005	08-11-97/TC
trichloroethylene	7.36	mg/l	624	0.005	08-11-97/TC
vinyl chloride	0.050	mg/l	624	0.005	08-11-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	105
toluene-d8	115
4-bromofluorobenzene	109

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: EW-5A WELL **DATE SAMPLED:** 08-06-97
REIC SAMPLE #: 53806-1 **MATRIX:** LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
2-chlorophenol	ND	mg/l	625	0.020	08-13-97/WP
2,4-dichlorophenol	ND	mg/l	625	0.020	08-13-97/WP
2,4-dimethylphenol	ND	mg/l	625	0.020	08-13-97/WP
4,6-dinitro-o-cresol (or 2-methyl-4,6-dinitrophenol)	ND	mg/l	625	0.020	08-13-97/WP
2,4-dinitrophenol	ND	mg/l	625	0.020	08-13-97/WP
2-nitrophenol	ND	mg/l	625	0.020	08-13-97/WP
4-nitrophenol	ND	mg/l	625	0.020	08-13-97/WP
p-chloro-m-cresol (or 4-chloro-3-methylphenol)	ND	mg/l	625	0.020	08-13-97/WP
pentachlorophenol	ND	mg/l	625	0.020	08-13-97/WP
phenol	ND	mg/l	625	0.020	08-13-97/WP
2,4,6-trichlorophenol	ND	mg/l	625	0.020	08-13-97/WP

Surrogates	% Recovery
2-fluorophenol	38
phenol-d6	24
2,4,6-tribromophenol	85

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: EW-5A WELL **DATE SAMPLED:** 08-06-97
REIC SAMPLE #: 53806-1 **MATRIX:** LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-BASE/NEUTRAL EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
acenaphthene	ND	mg/l	625	0.010	08-13-97/WP
acenaphthylene	ND	mg/l	625	0.010	08-13-97/WP
anthracene	ND	mg/l	625	0.010	08-13-97/WP
benzidine	ND	mg/l	625	0.010	08-13-97/WP
benzo(a)anthracene	ND	mg/l	625	0.010	08-13-97/WP
benzo(a)pyrene	ND	mg/l	625	0.010	08-13-97/WP
3,4-benzofluoranthene (or benzo(b)fluoranthene)	ND	mg/l	625	0.010	08-13-97/WP
benzo(ghi)perylene	ND	mg/l	625	0.010	08-13-97/WP
benzo(k)fluoranthene	ND	mg/l	625	0.010	08-13-97/WP
bis(2-chloroethoxy)methane	ND	mg/l	625	0.010	08-13-97/WP
bis(2-chloroethyl) ether	ND	mg/l	625	0.010	08-13-97/WP
bis(2-chloroisopropyl) ether	ND	mg/l	625	0.010	08-13-97/WP
bis(2-ethylhexyl)phthalate	ND	mg/l	625	0.010	08-13-97/WP
4-bromophenyl phenyl ether	ND	mg/l	625	0.010	08-13-97/WP
butylbenzyl phthalate	ND	mg/l	625	0.010	08-13-97/WP
2-chloronaphthalene	ND	mg/l	625	0.010	08-13-97/WP
4-chlorophenyl phenyl ether	ND	mg/l	625	0.010	08-13-97/WP
chrysene	ND	mg/l	625	0.010	08-13-97/WP
dibenzo(a,h)anthracene	ND	mg/l	625	0.010	08-13-97/WP

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: EW-5A WELL
REIC SAMPLE #: 53806-1
DATE SAMPLED: 08-06-97
MATRIX: LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-BASE/NEUTRAL EXTRACTABLES
(continued)

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
1,2-dichlorobenzene	ND	mg/l	625	0.010	08-13-97/WP
1,3-dichlorobenzene	ND	mg/l	625	0.010	08-13-97/WP
1,4-dichlorobenzene	ND	mg/l	625	0.010	08-13-97/WP
3,3'-dichlorobenzidine	ND	mg/l	625	0.010	08-13-97/WP
diethyl phthalate	ND	mg/l	625	0.010	08-13-97/WP
dimethyl phthalate	ND	mg/l	625	0.010	08-13-97/WP
di-n-butyl phthalate	ND	mg/l	625	0.010	08-13-97/WP
2,4-dinitrotoluene	ND	mg/l	625	0.010	08-13-97/WP
2,6-dinitrotoluene	ND	mg/l	625	0.010	08-13-97/WP
di-n-octyl phthalate	ND	mg/l	625	0.010	08-13-97/WP
1,2-diphenylhydrazine	ND	mg/l	625	0.010	08-13-97/WP
fluoranthene	ND	mg/l	625	0.010	08-13-97/WP
fluorene	ND	mg/l	625	0.010	08-13-97/WP
hexachlorobenzene	ND	mg/l	625	0.010	08-13-97/WP
hexachlorobutadiene	ND	mg/l	625	0.010	08-13-97/WP
hexachlorocyclopentadiene	ND	mg/l	625	0.010	08-13-97/WP
hexachloroethane	ND	mg/l	625	0.010	08-13-97/WP
indeno(1,2,3-cd)pyrene	ND	mg/l	625	0.010	08-13-97/WP
isophorone	ND	mg/l	625	0.010	08-13-97/WP
naphthalene	ND	mg/l	625	0.010	08-13-97/WP
nitrobenzene	ND	mg/l	625	0.010	08-13-97/WP
N-nitrosodimethylamine	ND	mg/l	625	0.010	08-13-97/WP
N-nitrosodi-n-propylamine	ND	mg/l	625	0.010	08-13-97/WP
N-nitrosodiphenylamine	ND	mg/l	625	0.010	08-13-97/WP

ND - None Deteced at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: EW-5A WELL
REIC SAMPLE #: 53806-1

DATE SAMPLED: 08-06-97
MATRIX: LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-BASE/NEUTRAL EXTRACTABLES
(continued)

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenanthrene	ND	mg/l	625	0.010	08-13-97/WP
pyrene	ND	mg/l	625	0.010	08-13-97/WP
1,2,4-trichlorobenzene	ND	mg/l	625	0.010	08-13-97/WP

Surrogates	% Recovery
nitrobenzene-d5	94
2-fluorobiphenyl	65
p-terphenyl-d14	81

ND - None Detected at MQL
MQL - Minimum Quantifying Level

Potes' & Associates, Inc.
ENGINEERS AND ENVIRONMENTAL CONSULTANTS
University of Charleston, Cox Hall
2300 MacCorkle Ave. SE, Charleston, WV 25304
Tel: (304) 357-4990 FAX: (304) 357-4988

CHAIN OF CUSTODY RECORD

№ 1202

PAGE 1 OF 1

CLIENT/SAMPLING SITE: MONSANTO TCE
CONTACT PERSON: CHRIS GROSE
ADDRESS: 1 MONSANTO ROAD
TELEPHONE/FAX: (304) 357-4990 / 4988
CITY/STATE/ZIP: NITRO WV 25143
SAMPLER: D. STOTTLEMYER
PROJECT NO.: 97025.001
DATE: 11-4-97
HOW SHIPPED: COURIER PICK-UP (REIC)

SAMPLE LOG AND ANALYSIS REQUESTED

TURNAROUND TIME: X REGULAR ___ RUSH

PRESERVATIVES
0 NO PRESERVATIVE
1 HYDROCHLORIC ACID
2 NITRIC ACID
3 SULFURIC ACID
4 SODIUM THIOSULFATE
5 SODIUM HYDROXIDE
6 ZINC ACETATE
7 EDTA

ANALYSIS REQUESTED & METHOD / PRESERVATIVE CODES

SAMPLE ID	NO. & TYPE OF CONTAINERS	DATE/TIME	MATRIX	SAMPLE COMP/GRAB	MODIFIED PRIORITY POLLUTANTS - NO DIOXIN - NO METALS - NO PESTICIDES - NO HERBICIDES											REMARKS
EW-5B WELL	2-1L(A)	11-3-97	H_2O	GRAB	X											
	2-40ml	11-3-97	H_2O	GRAB	X											
EW-5B MANHOLE	2-1L(A)	11-3-97	H_2O	GRAB	X											
	2-40ml	11-3-97	H_2O	GRAB	X											
TRIP BLANK	1-40ml															

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
[signature]	11-4-97 1045	[signature]	11/4/97		

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	CONDITION ON ARRIVAL:
[signature]	11/4/97 4:30 PM	[signature]	11-4-97 4:12	4° on ice

COMMENTS
* FAX RESULTS TO CHRIS GROSE (304) 357-4988
* REIC LABS

POTESTA SAMPLE #: EW-5B WELL **DATE SAMPLED:** 11-03-97
REIC SAMPLE #: 56123-1 **MATRIX:** LIQUID

PRIORITY POLLUTANT
VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
acrolein	ND	mg/l	624	0.100	11-11-97/TC
acrylonitrile	ND	mg/l	624	0.100	11-11-97/TC
benzene	0.043	mg/l	624	0.010	11-11-97/TC
bromoform	ND	mg/l	624	0.010	11-11-97/TC
carbon tetrachloride	ND	mg/l	624	0.010	11-11-97/TC
chlorobenzene	0.137	mg/l	624	0.010	11-11-97/TC
chlorodibromomethane	ND	mg/l	624	0.010	11-11-97/TC
chloroethane	ND	mg/l	624	0.010	11-11-97/TC
chloroform	0.105	mg/l	624	0.010	11-11-97/TC
cis-1,3-dichloropropylene	ND	mg/l	624	0.010	11-11-97/TC
dichlorobromomethane	ND	mg/l	624	0.010	11-11-97/TC
1,1-dichloroethane	ND	mg/l	624	0.010	11-11-97/TC
1,2-dichloroethane	0.024	mg/l	624	0.010	11-11-97/TC
1,1-dichloroethylene	ND	mg/l	624	0.010	11-11-97/TC
1,2-dichloropropane	0.014	mg/l	624	0.010	11-11-97/TC
ethylbenzene	ND	mg/l	624	0.010	11-11-97/TC
methyl bromide	ND	mg/l	624	0.010	11-11-97/TC
methyl chloride	ND	mg/l	624	0.010	11-11-97/TC
methylene chloride	ND	mg/l	624	0.010	11-11-97/TC
1,1,2,2-tetrachloroethane	ND	mg/l	624	0.010	11-11-97/TC
tetrachloroethylene	ND	mg/l	624	0.010	11-11-97/TC
toluene	ND	mg/l	624	0.010	11-11-97/TC
trans-1,2-dichloroethylene	0.146	mg/l	624	0.010	11-11-97/TC
trans-1,3-dichloropropylene	ND	mg/l	624	0.010	11-11-97/TC

ND - None Detected at MQL
MQL - Minimum Quantifying Level

POTESTA SAMPLE #: EW-5B WELL   **DATE SAMPLED:** 11-03-97
REIC SAMPLE #: 56123-1   **MATRIX:** LIQUID

PRIORITY POLLUTANT
VOLATILE ORGANIC COMPOUNDS (continued)

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
1,1,1-trichloroethane	ND	mg/l	624	0.010	11-11-97/TC
1,1,2-trichloroethane	ND	mg/l	624	0.010	11-11-97/TC
trichloroethylene	0.871	mg/l	624	0.010	11-11-97/TC
vinyl chloride	0.025	mg/l	624	0.010	11-11-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	98
toluene-d8	105
4-bromofluorobenzene	108

ND - None Detected at MQL
MQL - Minimum Quantifying Level

Potesta & Associates, Inc.
Job #: 1197-56123

POTESTA SAMPLE #: EW-5B WELL **DATE SAMPLED:** 11-03-97
REIC SAMPLE #: 56123-1 **MATRIX:** LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
2-chlorophenol	ND	mg/l	625	0.020	11-07-97/WP
2,4-dichlorophenol	ND	mg/l	625	0.020	11-07-97/WP
2,4-dimethylphenol	ND	mg/l	625	0.020	11-07-97/WP
4,6-dinitro-o-cresol (or 2-methyl-4,6-dinitrophenol)	ND	mg/l	625	0.020	11-07-97/WP
2,4-dinitrophenol	ND	mg/l	625	0.020	11-07-97/WP
2-nitrophenol	ND	mg/l	625	0.020	11-07-97/WP
4-nitrophenol	ND	mg/l	625	0.020	11-07-97/WP
p-chloro-m-cresol (or 4-chloro-3-methylphenol)	ND	mg/l	625	0.020	11-07-97/WP
pentachlorophenol	ND	mg/l	625	0.020	11-07-97/WP
phenol	ND	mg/l	625	0.020	11-07-97/WP
2,4,6-trichlorophenol	ND	mg/l	625	0.020	11-07-97/WP

Surrogates	% Recovery
2-fluorophenol	22
phenol-d6	39
2,4,6-tribromophenol	64

ND - None Detected at MQL
MQL - Minimum Quantifying Level

POTESTA SAMPLE #: EW-5B WELL
REIC SAMPLE #: 56123-1
DATE SAMPLED: 11-03-97
MATRIX: LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-BASE/NEUTRAL EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
acenaphthene	ND	mg/l	625	0.010	11-07-97/WP
acenaphthylene	ND	mg/l	625	0.010	11-07-97/WP
anthracene	ND	mg/l	625	0.010	11-07-97/WP
benzidine	ND	mg/l	625	0.010	11-07-97/WP
benzo(a)anthracene	ND	mg/l	625	0.010	11-07-97/WP
benzo(a)pyrene	ND	mg/l	625	0.010	11-07-97/WP
3,4-benzofluoranthene (or benzo(b)fluoranthene)	ND	mg/l	625	0.010	11-07-97/WP
benzo(ghi)perylene	ND	mg/l	625	0.010	11-07-97/WP
benzo(k)fluoranthene	ND	mg/l	625	0.010	11-07-97/WP
bis(2-chloroethoxy)methane	ND	mg/l	625	0.010	11-07-97/WP
bis(2-chloroethyl) ether	ND	mg/l	625	0.010	11-07-97/WP
bis(2-chloroisopropyl) ether	ND	mg/l	625	0.010	11-07-97/WP
bis(2-ethylhexyl)phthalate	ND	mg/l	625	0.010	11-07-97/WP
4-bromophenyl phenyl ether	ND	mg/l	625	0.010	11-07-97/WP
butylbenzyl phthalate	ND	mg/l	625	0.010	11-07-97/WP
2-chloronaphthalene	ND	mg/l	625	0.010	11-07-97/WP
4-chlorophenyl phenyl ether	ND	mg/l	625	0.010	11-07-97/WP
chrysene	ND	mg/l	625	0.010	11-07-97/WP
dibenzo(a,h)anthracene	ND	mg/l	625	0.010	11-07-97/WP

ND - None Detected at MQL
MQL - Minimum Quantifying Level

POTESTA SAMPLE #: EW-5B WELL **DATE SAMPLED:** 11-03-97
REIC SAMPLE #: 56123-1 **MATRIX:** LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-BASE/NEUTRAL EXTRACTABLES
(continued)

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
1,2-dichlorobenzene	ND	mg/l	625	0.010	11-07-97/WP
1,3-dichlorobenzene	ND	mg/l	625	0.010	11-07-97/WP
1,4-dichlorobenzene	ND	mg/l	625	0.010	11-07-97/WP
3,3'-dichlorobenzidine	ND	mg/l	625	0.010	11-07-97/WP
diethyl phthalate	ND	mg/l	625	0.010	11-07-97/WP
dimethyl phthalate	ND	mg/l	625	0.010	11-07-97/WP
di-n-butyl phthalate	ND	mg/l	625	0.010	11-07-97/WP
2,4-dinitrotoluene	ND	mg/l	625	0.010	11-07-97/WP
2,6-dinitrotoluene	ND	mg/l	625	0.010	11-07-97/WP
di-n-octyl phthalate	ND	mg/l	625	0.010	11-07-97/WP
1,2-diphenylhydrazine	ND	mg/l	625	0.010	11-07-97/WP
fluoranthene	ND	mg/l	625	0.010	11-07-97/WP
fluorene	ND	mg/l	625	0.010	11-07-97/WP
hexachlorobenzene	ND	mg/l	625	0.010	11-07-97/WP
hexachlorobutadiene	ND	mg/l	625	0.010	11-07-97/WP
hexachlorocyclopentadiene	ND	mg/l	625	0.010	11-07-97/WP
hexachloroethane	ND	mg/l	625	0.010	11-07-97/WP
indeno(1,2,3-cd)pyrene	ND	mg/l	625	0.010	11-07-97/WP
isophorone	ND	mg/l	625	0.010	11-07-97/WP
naphthalene	ND	mg/l	625	0.010	11-07-97/WP
nitrobenzene	ND	mg/l	625	0.010	11-07-97/WP
N-nitrosodimethylamine	ND	mg/l	625	0.010	11-07-97/WP
N-nitrosodi-n-propylamine	ND	mg/l	625	0.010	11-07-97/WP
N-nitrosodiphenylamine	ND	mg/l	625	0.010	11-07-97/WP

ND - None Deteced at MQL
MQL - Minimum Quantifying Level

POTESTA SAMPLE #: EW-5B WELL **DATE SAMPLED:** 11-03-97
REIC SAMPLE #: 56123-1 **MATRIX:** LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-BASE/NEUTRAL EXTRACTABLES
(continued)

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenanthrene	ND	mg/l	625	0.010	11-07-97/WP
pyrene	ND	mg/l	625	0.010	11-07-97/WP
1,2,4-trichlorobenzene	ND	mg/l	625	0.010	11-07-97/WP

Surrogates	% Recovery
nitrobenzene-d5	66
2-fluorobiphenyl	58
p-terphenyl-d14	*28

ND - None Detected at MQL
MQL - Minimum Quantifying Level
* - Surrogate recovery exceeds REIC control limits due to sample matrix interference.

REIC

CHAIN OF CUSTODY RECORD NO. 49003

REIC Laboratory
225 Industrial Park Rd.
P.O. Box 286, Beaver, WV 25813
Phone: 304-255-2500 or 800-999-0105
FAX: 304-255-2572

CLIENT: Potesta + Associates
ADDRESS: 2300 MacCorkle Ave SE
CITY/STATE/ZIP: Charleston, WV 25304
BILL TO: Monsanto Co. 1 Monsanto Rd
CITY/STATE/ZIP: Nitro, WV. 25143

CONTACT PERSON: Dave Junker
TELEPHONE/FAX: 304-357-4990/4988
SITE ID & STATE: Monsanto Co. WV.
PROJECT ID: 97025.002
SAMPLER: D. Junker

SAMPLE LOG AND ANALYSIS REQUEST

TURNAROUND TIME REQUIREMENTS
REGULAR:
*RUSH:
X 5-Day
___ 3-Day
___ 2-Day
___ 1-Day
*Rush work needs prior Laboratory approval and will include surcharges

PRESERVATIVES
0 No Preservative
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide
6 Zinc Acetate
7 EDTA

PRESERVATIVE CODES

ANALYSIS REQUESTED & METHOD: Priority Poll. Vol's + Semi Vol's

SAMPLE ID	NO. & TYPE OF CONTAINERS	SAMPLING DATE / TIME	MATRIX	SAMPLE COMP / GRAB	Priority Poll. Vol's + Semi Vol's													COMMENTS
EW-6A	2 - 40 ml / 2 Liters	5/9 0845	Liq	Grab	X													No PCBs, Herbicides or
LS-2-6A	"	5/9 0910	"	"	X													Pesticides
Eff-6A	"	5/9 0930	"	"	X													

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
David N. Junker	5/9/97	Donna V. Moog	5-9-97 2:05 PM	Donna V. Moog	5-9-97 5:30 PM	[illegible]	5/9 5:30

Special Requests: 4.3°C

Shipment: Hand-Del: Courier: UPS: FedEx: Shipment Date: FAX Results: Y N

MONSANTO SAMPLE #: EW-6A
REIC SAMPLE #: 51490-1

DATE SAMPLED: 05-09-97
MATRIX: LIQUID

PRIORITY POLLUTANT
VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
acrolein	ND	mg/l	624	0.050	05-14-97/TC
acrylonitrile	ND	mg/l	624	0.050	05-14-97/TC
benzene	0.005	mg/l	624	0.005	05-14-97/TC
bromoform	ND	mg/l	624	0.005	05-14-97/TC
carbon tetrachloride	0.021	mg/l	624	0.005	05-14-97/TC
chlorobenzene	0.015	mg/l	624	0.005	05-14-97/TC
chlorodibromomethane	ND	mg/l	624	0.005	05-14-97/TC
chloroethane	ND	mg/l	624	0.005	05-14-97/TC
2-chloroethyl vinyl ether	ND	mg/l	624	0.005	05-14-97/TC
chloroform	0.016	mg/l	624	0.005	05-14-97/TC
cis-1,3-dichloropropylene	ND	mg/l	624	0.005	05-14-97/TC
dichlorobromomethane	ND	mg/l	624	0.005	05-14-97/TC
1,1-dichloroethane	ND	mg/l	624	0.005	05-14-97/TC
1,2-dichloroethane	ND	mg/l	624	0.005	05-14-97/TC
1,1-dichloroethylene	ND	mg/l	624	0.005	05-14-97/TC
1,2-dichloropropane	ND	mg/l	624	0.005	05-14-97/TC
ethylbenzene	ND	mg/l	624	0.005	05-14-97/TC
methyl bromide	ND	mg/l	624	0.005	05-14-97/TC
methyl chloride	ND	mg/l	624	0.005	05-14-97/TC
methylene chloride	ND	mg/l	624	0.005	05-14-97/TC
1,1,2,2-tetrachloroethane	ND	mg/l	624	0.005	05-14-97/TC
tetrachloroethylene	ND	mg/l	624	0.005	05-14-97/TC
toluene	ND	mg/l	624	0.005	05-14-97/TC
trans-1,2-dichloroethylene	0.142	mg/l	624	0.005	05-14-97/TC
trans-1,3-dichloropropylene	ND	mg/l	624	0.005	05-14-97/TC

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: EW-6A
REIC SAMPLE #: 51490-1

DATE SAMPLED: 05-09-97
MATRIX: LIQUID

PRIORITY POLLUTANT
VOLATILE ORGANIC COMPOUNDS (continued)

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
1,1,1-trichloroethane	ND	mg/l	624	0.005	05-14-97/TC
1,1,2-trichloroethane	ND	mg/l	624	0.005	05-14-97/TC
trichloroethylene	0.980	mg/l	624	0.005	05-14-97/TC
vinyl chloride	0.011	mg/l	624	0.005	05-14-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	89
toluene-d8	98
4-bromofluorobenzene	87

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: EW-6A
REIC SAMPLE #: 51490-1

DATE SAMPLED: 05-09-97
MATRIX: LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
2-chlorophenol	ND	mg/l	625	0.020	05-15-97/WP
2,4-dichlorophenol	ND	mg/l	625	0.020	05-15-97/WP
2,4-dimethylphenol	ND	mg/l	625	0.020	05-15-97/WP
4,6-dinitro-o-cresol (or 2-methyl-4,6-dinitrophenol)	ND	mg/l	625	0.020	05-15-97/WP
2,4-dinitrophenol	ND	mg/l	625	0.020	05-15-97/WP
2-nitrophenol	ND	mg/l	625	0.020	05-15-97/WP
4-nitrophenol	ND	mg/l	625	0.020	05-15-97/WP
p-chloro-m-cresol (or 4-chloro-3-methylphenol)	ND	mg/l	625	0.020	05-15-97/WP
pentachlorophenol	ND	mg/l	625	0.020	05-15-97/WP
phenol	ND	mg/l	625	0.020	05-15-97/WP
2,4,6-trichlorophenol	ND	mg/l	625	0.020	05-15-97/WP

Surrogates	% Recovery
2-fluorophenol	34
phenol-d6	22
2,4,6-tribromophenol	87

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: EW-6A
REIC SAMPLE #: 51490-1

DATE SAMPLED: 05-09-97
MATRIX: LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-BASE/NEUTRAL EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
acenaphthene	ND	mg/l	625	0.010	05-15-97/WP
acenaphthylene	ND	mg/l	625	0.010	05-15-97/WP
anthracene	ND	mg/l	625	0.010	05-15-97/WP
benzidine	ND	mg/l	625	0.010	05-15-97/WP
benzo(a)anthracene	ND	mg/l	625	0.010	05-15-97/WP
benzo(a)pyrene	ND	mg/l	625	0.010	05-15-97/WP
3,4-benzofluoranthene (or benzo(b)fluoranthene)	ND	mg/l	625	0.010	05-15-97/WP
benzo(ghi)perylene	ND	mg/l	625	0.010	05-15-97/WP
benzo(k)fluoranthene	ND	mg/l	625	0.010	05-15-97/WP
bis(2-chloroethoxy)methane	ND	mg/l	625	0.010	05-15-97/WP
bis(2-chloroethyl) ether	ND	mg/l	625	0.010	05-15-97/WP
bis(2-chloroisopropyl) ether	ND	mg/l	625	0.010	05-15-97/WP
bis(2-ethylhexyl)phthalate	ND	mg/l	625	0.010	05-15-97/WP
4-bromophenyl phenyl ether	ND	mg/l	625	0.010	05-15-97/WP
butylbenzyl phthalate	ND	mg/l	625	0.010	05-15-97/WP
2-chloronaphthalene	ND	mg/l	625	0.010	05-15-97/WP
4-chlorophenyl phenyl ether	ND	mg/l	625	0.010	05-15-97/WP
chrysene	ND	mg/l	625	0.010	05-15-97/WP
dibenzo(a,h)anthracene	ND	mg/l	625	0.010	05-15-97/WP

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: EW-6A
REIC SAMPLE #: 51490-1

DATE SAMPLED: 05-09-97
MATRIX: LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-BASE/NEUTRAL EXTRACTABLES
(continued)

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
1,2-dichlorobenzene	ND	mg/l	625	0.010	05-15-97/WP
1,3-dichlorobenzene	ND	mg/l	625	0.010	05-15-97/WP
1,4-dichlorobenzene	ND	mg/l	625	0.010	05-15-97/WP
3,3'-dichlorobenzidine	ND	mg/l	625	0.010	05-15-97/WP
diethyl phthalate	ND	mg/l	625	0.010	05-15-97/WP
dimethyl phthalate	ND	mg/l	625	0.010	05-15-97/WP
di-n-butyl phthalate	ND	mg/l	625	0.010	05-15-97/WP
2,4-dinitrotoluene	ND	mg/l	625	0.010	05-15-97/WP
2,6-dinitrotoluene	ND	mg/l	625	0.010	05-15-97/WP
di-n-octyl phthalate	ND	mg/l	625	0.010	05-15-97/WP
1,2-diphenylhydrazine	ND	mg/l	625	0.010	05-15-97/WP
fluoranthene	ND	mg/l	625	0.010	05-15-97/WP
fluorene	ND	mg/l	625	0.010	05-15-97/WP
hexachlorobenzene	ND	mg/l	625	0.010	05-15-97/WP
hexachlorobutadiene	ND	mg/l	625	0.010	05-15-97/WP
hexachlorocyclopentadiene	ND	mg/l	625	0.010	05-15-97/WP
hexachloroethane	ND	mg/l	625	0.010	05-15-97/WP
indeno(1,2,3-cd)pyrene	ND	mg/l	625	0.010	05-15-97/WP
isophorone	ND	mg/l	625	0.010	05-15-97/WP
naphthalene	ND	mg/l	625	0.010	05-15-97/WP
nitrobenzene	ND	mg/l	625	0.010	05-15-97/WP
N-nitrosodimethylamine	ND	mg/l	625	0.010	05-15-97/WP
N-nitrosodi-n-propylamine	ND	mg/l	625	0.010	05-15-97/WP
N-nitrosodiphenylamine	ND	mg/l	625	0.010	05-15-97/WP

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: EW-6A
REIC SAMPLE #: 51490-1

DATE SAMPLED: 05-09-97
MATRIX: LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-BASE/NEUTRAL EXTRACTABLES
(continued)

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenanthrene	ND	mg/l	625	0.010	05-15-97/WP
pyrene	ND	mg/l	625	0.010	05-15-97/WP
1,2,4-trichlorobenzene	ND	mg/l	625	0.010	05-15-97/WP

Surrogates	% Recovery
nitrobenzene-d5	105
2-fluorobiphenyl	70
p-terphenyl-d14	80

ND - None Detected at MQL
MQL - Minimum Quantifying Level

REIC Laboratory
225 Industrial Park Rd,
P.O. Box 286, Beaver, WV 25813
Phone: 304-255-2500 or 800-999-0105
FAX: 304-255-2572

CHAIN OF CUSTODY RECORD NO. / 008

CLIENT: MONSANTO CO.
ADDRESS: NO. 1 MONSANTO RD.
CITY/STATE/ZIP: NITRO WV.
BILL TO: MONSANTO CO.
CITY/STATE/ZIP: NITRO WV.

CONTACT PERSON: CHRIS GROSE
TELEPHONE/FAX: (304) 357-4990 / 498.
SITE ID & STATE: MONSANTO TCE, WV
PROJECT ID: 97025
SAMPLER: C. GROSE

SAMPLE LOG AND ANALYSIS REQUEST

TURNAROUND TIME REQUIREMENTS
REGULAR: X
*RUSH: ___ 5-Day ___ 3-Day ___ 2-Day ___ 1-Day
*Rush work needs prior Laboratory approval and will include surcharges

PRESERVATIVES
0 No Preservative
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide
6 Zinc Acetate
7 EDTA

PRESERVATIVE CODES

ANALYSIS REQUESTED & METHOD: MODIFIED PRIORITY POLL. - NO METALS / NO DIOXIN

SAMPLE ID	NO. & TYPE OF CONTAINERS	SAMPLING DATE / TIME	MATRIX	SAMPLE COMP / GRAB	MODIFIED PRIORITY POLL. - NO METALS / NO DIOXIN	COMMENTS
EW-~~6B~~ 6A	1-1L	7/22/97 12:35	H_2O	GRAB	X	
EW-~~6B~~ 6A (L.S. #1)	1-1L	7/22/97 12:30	H_2O	GRAB	X	
EW-~~6B~~ 6A	2-40ml	7/22/97 12:35	H_2O	GRAB	X	
EW-~~6B~~ 6A (L.S. #1)	2-40ml	7/22/97 12:30	H_2O	GRAB	X	
						4°C
						* PLEASE FAX A COPY OF THE RESULTS TO CHRIS GROSE / 357-4988

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
	7/22/97	[signature]	7/22/97	[signature]	7/22/97 4:20	[signature]	7-23 [illegible]

Special Requests: Analysis same as EW7B + EW7B (L.S. #1)

Shipment: Hand-Del: Courier: UPS: FedEx:

Shipment Date: FAX Results: Y N

MONSANTO SAMPLE #: ~~EW-6B~~ EW-6A per COC
REIC SAMPLE #: 53416-1

DATE SAMPLED: 07-22-97
MATRIX: LIQUID

PRIORITY POLLUTANT
VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
acrolein	ND	mg/l	8240B	0.050	07-28-97/TC
acrylonitrile	ND	mg/l	8240B	0.050	07-28-97/TC
benzene	0.046	mg/l	8240B	0.005	07-28-97/TC
bromoform	ND	mg/l	8240B	0.005	07-28-97/TC
carbon tetrachloride	0.060	mg/l	8240B	0.005	07-28-97/TC
chlorobenzene	0.047	mg/l	8240B	0.005	07-28-97/TC
chlorodibromomethane	ND	mg/l	8240B	0.005	07-28-97/TC
chloroethane	ND	mg/l	8240B	0.005	07-28-97/TC
2-chloroethyl vinyl ether	ND	mg/l	8240B	0.005	07-28-97/TC
chloroform	0.023	mg/l	8240B	0.005	07-28-97/TC
cis-1,3-dichloropropylene	ND	mg/l	8240B	0.005	07-28-97/TC
dichlorobromomethane	ND	mg/l	8240B	0.005	07-28-97/TC
1,1-dichloroethane	ND	mg/l	8240B	0.005	07-28-97/TC
1,2-dichloroethane	0.010	mg/l	8240B	0.005	07-28-97/TC
1,1-dichloroethylene	0.007	mg/l	8240B	0.005	07-28-97/TC
1,2-dichloropropane	0.009	mg/l	8240B	0.005	07-28-97/TC
ethylbenzene	ND	mg/l	8240B	0.005	07-28-97/TC
methyl bromide	ND	mg/l	8240B	0.005	07-28-97/TC
methyl chloride	ND	mg/l	8240B	0.005	07-28-97/TC
methylene chloride	ND	mg/l	8240B	0.005	07-28-97/TC
1,1,2,2-tetrachloroethane	ND	mg/l	8240B	0.005	07-28-97/TC
tetrachloroethylene	ND	mg/l	8240B	0.005	07-28-97/TC
toluene	ND	mg/l	8240B	0.005	07-28-97/TC
trans-1,2-dichloroethylene	0.344	mg/l	8240B	0.005	07-28-97/TC
trans-1,3-dichloropropylene	ND	mg/l	8240B	0.005	07-28-97/TC

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: ~~EW-6B~~ EW-6A per COC **DATE SAMPLED:** 07-22-97
REIC SAMPLE #: 53416-1 **MATRIX:** LIQUID

PRIORITY POLLUTANT
VOLATILE ORGANIC COMPOUNDS (continued)

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
1,1,1-trichloroethane	ND	mg/l	8240B	0.005	07-28-97/TC
1,1,2-trichloroethane	0.025	mg/l	8240B	0.005	07-28-97/TC
trichloroethylene	1.13	mg/l	8240B	0.005	07-28-97/TC
vinyl chloride	1.13	mg/l	8240B	0.005	07-28-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	107
toluene-d8	101
4-bromofluorobenzene	98

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: ~~EW-6B~~ EW-6A per COC
REIC SAMPLE #: 53416-1

DATE SAMPLED: 07-22-97
MATRIX: LIQUID

SEMIVOLATILE ORGANIC COMPOUNDS - ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	07-28-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	07-28-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	07-28-97/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	07-28-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	07-28-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	07-28-97/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	07-28-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	07-28-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	07-28-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	07-28-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	07-28-97/WP
2,4,5-trichlorophenol	0.060	mg/l	8270B	0.020	07-28-97/WP
o-cresol	ND	mg/l	8270B	0.020	07-28-97/WP
m,p-cresol	ND	mg/l	8270B	0.040	07-28-97/WP

Surrogates	% Recovery
2-fluorophenol	43
phenol-d6	29
2,4,6-tribromophenol	61

ND - None Detected at MQL
MQL - Minimum Quantifying Level

REIC

CHAIN OF CUSTODY RECORD NO. 5 [illegible]25

REIC Laboratory
225 Industrial Park Rd.
P.O. Box 286, Beaver, WV 25813
Phone: 304-255-2500 or 800-999-0105
FAX: 304-255-2572

CLIENT: MONSANTO
ADDRESS:
CITY/STATE/ZIP:
BILL TO:
CITY/STATE/ZIP:

CONTACT PERSON:
TELEPHONE/FAX:
SITE ID & STATE:
PROJECT ID:
SAMPLER:

SAMPLE LOG AND ANALYSIS REQUEST

TURNAROUND TIME REQUIREMENTS
REGULAR: ✓
*RUSH: 5-Day / 3-Day / 2-Day / 1-Day
*Rush work needs prior Laboratory approval and will include surcharges

PRESERVATIVES
0 No Preservative
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide
6 Zinc Acetate
7 EDTA

NOTE PRESERVATIVES →
PRESERVATIVE CODES

ANALYSIS REQUESTED & METHOD: MOD. PRI. POLL

SAMPLE ID	NO. & TYPE OF CONTAINERS	SAMPLING DATE / TIME	MATRIX	SAMPLE COMP / GRAB	MOD. PRI. POLL	COMMENTS
EW-6~~A~~B	2-40mL VOC 1-Liter Glass	7-23-97			X	7-25-97 COC filled out at lab.
EW-6~~A~~B(LS#1)	↓	↓			X	
EW-6~~B~~A EFFLUENT	↓	↓			X	
						7-30-97 Change EW-6A + EW-6A (L.S.) to EW-6B + EW-6B (L.S.) Per Cris Grace

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
						Juanita Kittle	7-25 4:00

Special Requests:

Sample Condition: Good? Y N

Temperature Upon Arrival 4.4 °C OK

Shipment: Hand-Del: Courier: UPS: FedEx:

Shipment Date:

FAX Results: Y N

MONSANTO SAMPLE #: EW-6B
REIC SAMPLE #: 53533-1

DATE SAMPLED: 07-23-97
MATRIX: LIQUID

PRIORITY POLLUTANT
VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
acrolein	ND	mg/l	624	0.050	07-30-97/TC
acrylonitrile	ND	mg/l	624	0.050	07-30-97/TC
benzene	0.005	mg/l	624	0.005	07-30-97/TC
bromoform	ND	mg/l	624	0.005	07-30-97/TC
carbon tetrachloride	0.023	mg/l	624	0.005	07-30-97/TC
chlorobenzene	0.021	mg/l	624	0.005	07-30-97/TC
chlorodibromomethane	ND	mg/l	624	0.005	07-30-97/TC
chloroethane	ND	mg/l	624	0.005	07-30-97/TC
2-chloroethyl vinyl ether	ND	mg/l	624	0.005	07-30-97/TC
chloroform	0.017	mg/l	624	0.005	07-30-97/TC
cis-1,3-dichloropropylene	ND	mg/l	624	0.005	07-30-97/TC
dichlorobromomethane	ND	mg/l	624	0.005	07-30-97/TC
1,1-dichloroethane	ND	mg/l	624	0.005	07-30-97/TC
1,2-dichloroethane	ND	mg/l	624	0.005	07-30-97/TC
1,1-dichloroethylene	ND	mg/l	624	0.005	07-30-97/TC
1,2-dichloropropane	ND	mg/l	624	0.005	07-30-97/TC
ethylbenzene	0.015	mg/l	624	0.005	07-30-97/TC
methyl bromide	ND	mg/l	624	0.005	07-30-97/TC
methyl chloride	ND	mg/l	624	0.005	07-30-97/TC
methylene chloride	ND	mg/l	624	0.005	07-30-97/TC
1,1,2,2-tetrachloroethane	ND	mg/l	624	0.005	07-30-97/TC
tetrachloroethylene	ND	mg/l	624	0.005	07-30-97/TC
toluene	0.006	mg/l	624	0.005	07-30-97/TC
trans-1,2-dichloroethylene	0.111	mg/l	624	0.005	07-30-97/TC
trans-1,3-dichloropropylene	ND	mg/l	624	0.005	07-30-97/TC

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: EW-6B **DATE SAMPLED:** 07-23-97
REIC SAMPLE #: 53533-1 **MATRIX:** LIQUID

PRIORITY POLLUTANT
VOLATILE ORGANIC COMPOUNDS (continued)

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
1,1,1-trichloroethane	ND	mg/l	624	0.005	07-30-97/TC
1,1,2-trichloroethane	ND	mg/l	624	0.005	07-30-97/TC
trichloroethylene	0.752	mg/l	624	0.005	07-30-97/TC
vinyl chloride	0.030	mg/l	624	0.005	07-30-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	102
toluene-d8	87
4-bromofluorobenzene	89

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: EW-6B
REIC SAMPLE #: 53533-1

DATE SAMPLED: 07-23-97
MATRIX: LIQUID

SEMIVOLATILE ORGANIC COMPOUNDS - ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	625	0.020	07-29-97/WP
2-chlorophenol	ND	mg/l	625	0.020	07-29-97/WP
2-nitrophenol	ND	mg/l	625	0.020	07-29-97/WP
2,4-dimethylphenol	ND	mg/l	625	0.020	07-29-97/WP
2,4-dichlorophenol	ND	mg/l	625	0.020	07-29-97/WP
4-chloro-3-methylphenol	ND	mg/l	625	0.020	07-29-97/WP
2,4,6-trichlorophenol	ND	mg/l	625	0.020	07-29-97/WP
2,4-dinitrophenol	ND	mg/l	625	0.020	07-29-97/WP
4-nitrophenol	ND	mg/l	625	0.020	07-29-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	625	0.020	07-29-97/WP
pentachlorophenol	ND	mg/l	625	0.020	07-29-97/WP
2,4,5-trichlorophenol	ND	mg/l	625	0.020	07-29-97/WP
o-cresol	ND	mg/l	625	0.020	07-29-97/WP
m,p-cresol	ND	mg/l	625	0.040	07-29-97/WP

Surrogates	% Recovery
2-fluorophenol	88
phenol-d6	87
2,4,6-tribromophenol	79

ND - None Detected at MQL
MQL - Minimum Quantifying Level

Potes[illegible] & Associates, Inc.
ENGINEERS AND ENVIRONMENTAL CONSULTANTS
University of Charleston, Cox Hall
2300 MacCorkle Ave. SE, Charleston, WV 25304
Tel: (304) 357-4990 FAX: (304) 357-4988

CHAIN OF CUSTODY RECORD
№ 1172
PAGE 1 OF 1

CLIENT/SAMPLING SITE: MONSANTO TCE
ADDRESS: 1 MONSANTO ROAD
CITY/STATE/ZIP: NITRO, WV 25143
PROJECT NO.: 97025.001 DATE: 8-12-97
CONTACT PERSON: CHRIS GROSE
TELEPHONE/FAX: (304) 357-4990 / 4988
SAMPLER: D. STOTTLEMYER
HOW SHIPPED: COURIER / REIC

SAMPLE LOG AND ANALYSIS REQUESTED

TURNAROUND TIME: X REGULAR ___ RUSH

PRESERVATIVES
0 NO PRESERVATIVE
1 HYDROCHLORIC ACID
2 NITRIC ACID
3 SULFURIC ACID
4 SODIUM THIOSULFATE
5 SODIUM HYDROXIDE
6 ZINC ACETATE
7 EDTA

PRESERVATIVE CODES

SAMPLE ID	NO. & TYPE OF CONTAINERS	DATE/TIME	MATRIX	SAMPLE COMP/GRAB	ANALYSIS REQUESTED & METHOD: MODIFIED PRIORITY POLLUTANTS - NO METALS - NO DIOXIN	REMARKS
EW-6B WELL	2-40ml (6)	8-11-97 1555	H_2O	GRAB	X	
EW-6B WELL	2-1L (6)	8-11-97 1555	H_2O	GRAB	X	
EW-6B MANHOLE	2-40ml (6)	8-11-97 1550	H_2O	GRAB	X	
EW-6B MANHOLE	2-1L (6)	8-11-97 1550	H_2O	GRAB	X	

RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
[signature]	8-12-97 0820	[signature]	[signature]	8-12-97 4:15	

RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE/TIME	CONDITION ON ARRIVAL:
		[signature]	8-12-97 4:15	4.0

COMMENTS
* THIS IS A RETEST
* FAX RESULTS TO CHRIS GROSE

POTESTA SAMPLE #: EW-6B WELL **DATE SAMPLED:** 08-11-97
REIC SAMPLE #: 53913-1 **MATRIX:** LIQUID

PRIORITY POLLUTANT
VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
acrolein	ND	mg/l	8240B	0.005	08-14-97/TC
acrylonitrile	ND	mg/l	8240B	0.005	08-14-97/TC
benzene	0.051	mg/l	8240B	0.005	08-14-97/TC
bromoform	ND	mg/l	8240B	0.005	08-14-97/TC
carbon tetrachloride	0.048	mg/l	8240B	0.005	08-14-97/TC
chlorobenzene	0.046	mg/l	8240B	0.005	08-14-97/TC
chlorodibromomethane	ND	mg/l	8240B	0.005	08-14-97/TC
chloroethane	ND	mg/l	8240B	0.005	08-14-97/TC
chloroform	0.022	mg/l	8240B	0.005	08-14-97/TC
cis-1,3-dichloropropylene	ND	mg/l	8240B	0.005	08-14-97/TC
dichlorobromomethane	ND	mg/l	8240B	0.005	08-14-97/TC
1,1-dichloroethane	ND	mg/l	8240B	0.005	08-14-97/TC
1,2-dichloroethane	0.010	mg/l	8240B	0.005	08-14-97/TC
1,1-dichloroethylene	0.006	mg/l	8240B	0.005	08-14-97/TC
1,2-dichloropropane	0.008	mg/l	8240B	0.005	08-14-97/TC
ethylbenzene	ND	mg/l	8240B	0.005	08-14-97/TC
methyl bromide	ND	mg/l	8240B	0.005	08-14-97/TC
methyl chloride	ND	mg/l	8240B	0.005	08-14-97/TC
methylene chloride	ND	mg/l	8240B	0.005	08-14-97/TC
1,1,2,2-tetrachloroethane	ND	mg/l	8240B	0.005	08-14-97/TC
tetrachloroethylene	ND	mg/l	8240B	0.005	08-14-97/TC
toluene	ND	mg/l	8240B	0.005	08-14-97/TC
trans-1,2-dichloroethylene	0.454	mg/l	8240B	0.005	08-14-97/TC
trans-1,3-dichloropropylene	ND	mg/l	8240B	0.005	08-14-97/TC

ND - None Detected at MQL
MQL - Minimum Quantifying Level

POTESTA SAMPLE #:	**EW-6B WELL**	**DATE SAMPLED:**	**08-11-97**
REIC SAMPLE #:	**53913-1**	**MATRIX:**	**LIQUID**

PRIORITY POLLUTANT
VOLATILE ORGANIC COMPOUNDS (continued)

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
1,1,1-trichloroethane	ND	mg/l	8240B	0.005	08-14-97/TC
1,1,2-trichloroethane	0.027	mg/l	8240B	0.005	08-14-97/TC
trichloroethylene	1.96	mg/l	8240B	0.005	08-14-97/TC
vinyl chloride	1.19	mg/l	8240B	0.005	08-14-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	95
toluene-d8	98
4-bromofluorobenzene	97

ND - None Detected at MQL
MQL - Minimum Quantifying Level

POTESTA SAMPLE #: EW-6B WELL **DATE SAMPLED:** 08-11-97
REIC SAMPLE #: 53913-1 **MATRIX:** LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
2-chlorophenol	ND	mg/l	625	0.020	08-17-97/WP
2,4-dichlorophenol	ND	mg/l	625	0.020	08-17-97/WP
2,4-dimethylphenol	ND	mg/l	625	0.020	08-17-97/WP
4,6-dinitro-o-cresol (or 2-methyl-4,6-dinitrophenol)	ND	mg/l	625	0.020	08-17-97/WP
2,4-dinitrophenol	ND	mg/l	625	0.020	08-17-97/WP
2-nitrophenol	ND	mg/l	625	0.020	08-17-97/WP
4-nitrophenol	ND	mg/l	625	0.020	08-17-97/WP
p-chloro-m-cresol (or 4-chloro-3-methylphenol)	ND	mg/l	625	0.020	08-17-97/WP
pentachlorophenol	ND	mg/l	625	0.020	08-17-97/WP
phenol	ND	mg/l	625	0.020	08-17-97/WP
2,4,6-trichlorophenol	ND	mg/l	625	0.020	08-17-97/WP

Surrogates	% Recovery
2-fluorophenol	31
phenol-d6	25
2,4,6-tribromophenol	87

ND - None Detected at MQL
MQL - Minimum Quantifying Level

POTESTA SAMPLE #: EW-6B WELL **DATE SAMPLED:** 08-11-97
REIC SAMPLE #: 53913-1 **MATRIX:** LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-BASE/NEUTRAL EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
acenaphthene	ND	mg/l	625	0.010	08-17-97/WP
acenaphthylene	ND	mg/l	625	0.010	08-17-97/WP
anthracene	ND	mg/l	625	0.010	08-17-97/WP
benzidine	ND	mg/l	625	0.010	08-17-97/WP
benzo(a)anthracene	ND	mg/l	625	0.010	08-17-97/WP
benzo(a)pyrene	ND	mg/l	625	0.010	08-17-97/WP
3,4-benzofluoranthene (or benzo(b)fluoranthene)	ND	mg/l	625	0.010	08-17-97/WP
benzo(ghi)perylene	ND	mg/l	625	0.010	08-17-97/WP
benzo(k)fluoranthene	ND	mg/l	625	0.010	08-17-97/WP
bis(2-chloroethoxy)methane	ND	mg/l	625	0.010	08-17-97/WP
bis(2-chloroethyl) ether	0.034	mg/l	625	0.010	08-17-97/WP
bis(2-chloroisopropyl) ether	ND	mg/l	625	0.010	08-17-97/WP
bis(2-ethylhexyl)phthalate	ND	mg/l	625	0.010	08-17-97/WP
4-bromophenyl phenyl ether	ND	mg/l	625	0.010	08-17-97/WP
butylbenzyl phthalate	ND	mg/l	625	0.010	08-17-97/WP
2-chloronaphthalene	ND	mg/l	625	0.010	08-17-97/WP
4-chlorophenyl phenyl ether	ND	mg/l	625	0.010	08-17-97/WP
chrysene	ND	mg/l	625	0.010	08-17-97/WP
dibenzo(a,h)anthracene	ND	mg/l	625	0.010	08-17-97/WP

ND - None Detected at MQL
MQL - Minimum Quantifying Level

POTESTA SAMPLE #: EW-6B WELL
REIC SAMPLE #: 53913-1

DATE SAMPLED: 08-11-97
MATRIX: LIQUID

PRIORITY POLLUTANT SEMIVOLATILE ORGANIC COMPOUNDS-BASE/NEUTRAL EXTRACTABLES (continued)

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
1,2-dichlorobenzene	ND	mg/l	625	0.010	08-17-97/WP
1,3-dichlorobenzene	ND	mg/l	625	0.010	08-17-97/WP
1,4-dichlorobenzene	ND	mg/l	625	0.010	08-17-97/WP
3,3'-dichlorobenzidine	ND	mg/l	625	0.010	08-17-97/WP
diethyl phthalate	ND	mg/l	625	0.010	08-17-97/WP
dimethyl phthalate	ND	mg/l	625	0.010	08-17-97/WP
di-n-butyl phthalate	ND	mg/l	625	0.010	08-17-97/WP
2,4-dinitrotoluene	ND	mg/l	625	0.010	08-17-97/WP
2,6-dinitrotoluene	ND	mg/l	625	0.010	08-17-97/WP
di-n-octyl phthalate	ND	mg/l	625	0.010	08-17-97/WP
1,2-diphenylhydrazine	ND	mg/l	625	0.010	08-17-97/WP
fluoranthene	ND	mg/l	625	0.010	08-17-97/WP
fluorene	ND	mg/l	625	0.010	08-17-97/WP
hexachlorobenzene	ND	mg/l	625	0.010	08-17-97/WP
hexachlorobutadiene	ND	mg/l	625	0.010	08-17-97/WP
hexachlorocyclopentadiene	ND	mg/l	625	0.010	08-17-97/WP
hexachloroethane	ND	mg/l	625	0.010	08-17-97/WP
indeno(1,2,3-cd)pyrene	ND	mg/l	625	0.010	08-17-97/WP
isophorone	ND	mg/l	625	0.010	08-17-97/WP
naphthalene	ND	mg/l	625	0.010	08-17-97/WP
nitrobenzene	ND	mg/l	625	0.010	08-17-97/WP
N-nitrosodimethylamine	ND	mg/l	625	0.010	08-17-97/WP
N-nitrosodi-n-propylamine	ND	mg/l	625	0.010	08-17-97/WP
N-nitrosodiphenylamine	ND	mg/l	625	0.010	08-17-97/WP

ND - None Detected at MQL
MQL - Minimum Quantifying Level

POTESTA SAMPLE #:	**EW-6B WELL**	**DATE SAMPLED:**	**08-11-97**
REIC SAMPLE #:	**53913-1**	**MATRIX:**	**LIQUID**

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-BASE/NEUTRAL EXTRACTABLES
(continued)

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenanthrene	ND	mg/l	625	0.010	08-17-97/WP
pyrene	ND	mg/l	625	0.010	08-17-97/WP
1,2,4-trichlorobenzene	ND	mg/l	625	0.010	08-17-97/WP

Surrogates	% Recovery
nitrobenzene-d5	64
2-fluorobiphenyl	63
p-terphenyl-d14	71

ND - None Detected at MQL
MQL - Minimum Quantifying Level

Potes . & Associates, Inc.
ENGINEERS AND ENVIRONMENTAL CONSULTANTS
University of Charleston, Cox Hall
2300 MacCorkle Ave. SE, Charleston, WV 25304
Tel: (304) 357-4990 FAX: (304) 357-4988

CHAIN OF CUSTODY ..CORD
№ 1239
PAGE 1 OF 1

CLIENT/SAMPLING SITE: MONSANTO CO. TCE
CONTACT PERSON: CHRIS GROSE
ADDRESS: 1 MONSANTO ROAD
TELEPHONE/FAX: (304) 357-4990 / 4998
CITY/STATE/ZIP: NITRO WV 25309
SAMPLER: D- STOTTLEMYER
PROJECT NO.: 97025
DATE: 9-4-97
HOW SHIPPED: COURIER PICK UP (REIC)

SAMPLE LOG AND ANALYSIS REQUESTED

TURNAROUND TIME
x REGULAR
RUSH

PRESERVATIVES
0 NO PRESERVATIVE
1 HYDROCHLORIC ACID
2 NITRIC ACID
3 SULFURIC ACID
4 SODIUM THIOSULFATE
5 SODIUM HYDROXIDE
6 ZINC ACETATE
7 EDTA

ANALYSIS REQUESTED & METHOD: MODIFIED PRIORITY POLLUTANTS * NO METALS * NO DIOXIN

PRESERVATIVE CODES

SAMPLE ID	NO. & TYPE OF CONTAINERS	DATE/TIME	MATRIX	SAMPLE COMP/GRAB	MODIFIED PRIORITY POLLUTANTS * NO METALS * NO DIOXIN											REMARKS
5A, 7B EFFLUENT	2-40 ml	9-4-97 1130	H_2O	GRAB	X											* FAX RESULTS
5A, 7B EFFLUENT	2 ~~40 ml~~ 1L	9-4-97 1130	H_2O	GRAB	X											TO CHRIS GROSE
EW-6B WELL	2-40 ml	9-4-97 1140	H_2O	GRAB	X											
EW-6B WELL	2-1L	9-4-97 1145	H_2O	GRAB	X											
EW-6B MANHOLE	2-40 ml	9-4-97 1145	H_2O	GRAB	X											
EW-6B MANHOLE	2-1L	9-4-97 1145	H_2O	GRAB	X											

RELINQUISHED BY:(SIGNATURE)	DATE/TIME	RECEIVED BY:(SIGNATURE)	RELINQUISHED BY:(SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
[signature]	9-4-97 1255	[signature] 9/4/97 1:00			

RELINQUISHED BY:(SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY:(SIGNATURE)	DATE/TIME	CONDITION ON ARRIVAL:
		Juanita Ritter	9/4/97 @ 4:15	OK. 4.3°C

COMMENTS REIC

POTESTA SAMPLE #: EW-6B WELL **DATE SAMPLED:** 09-04-97
REIC SAMPLE #: 54450-2 **MATRIX:** LIQUID

PRIORITY POLLUTANT
VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
acrolein	ND	mg/l	624	0.050	09-08-97/TC
acrylonitrile	ND	mg/l	624	0.050	09-08-97/TC
benzene	0.061	mg/l	624	0.005	09-08-97/TC
bromoform	ND	mg/l	624	0.005	09-08-97/TC
carbon tetrachloride	0.065	mg/l	624	0.005	09-08-97/TC
chlorobenzene	0.051	mg/l	624	0.005	09-08-97/TC
chlorodibromomethane	ND	mg/l	624	0.005	09-08-97/TC
chloroethane	ND	mg/l	624	0.005	09-08-97/TC
chloroform	0.021	mg/l	624	0.005	09-08-97/TC
cis-1,3-dichloropropylene	ND	mg/l	624	0.005	09-08-97/TC
dichlorobromomethane	ND	mg/l	624	0.005	09-08-97/TC
1,1-dichloroethane	ND	mg/l	624	0.005	09-08-97/TC
1,2-dichloroethane	0.006	mg/l	624	0.005	09-08-97/TC
1,1-dichloroethylene	ND	mg/l	624	0.005	09-08-97/TC
1,2-dichloropropane	0.008	mg/l	624	0.005	09-08-97/TC
ethylbenzene	ND	mg/l	624	0.005	09-08-97/TC
methyl bromide	ND	mg/l	624	0.005	09-08-97/TC
methyl chloride	ND	mg/l	624	0.005	09-08-97/TC
methylene chloride	ND	mg/l	624	0.005	09-08-97/TC
1,1,2,2-tetrachloroethane	ND	mg/l	624	0.005	09-08-97/TC
tetrachloroethylene	ND	mg/l	624	0.005	09-08-97/TC
toluene	ND	mg/l	624	0.005	09-08-97/TC
trans-1,2-dichloroethylene	0.343	mg/l	624	0.005	09-08-97/TC
trans-1,3-dichloropropylene	ND	mg/l	624	0.005	09-08-97/TC

ND - None Detected at MQL
MQL - Minimum Quantifying Level

POTESTA SAMPLE #: EW-6B WELL **DATE SAMPLED:** 09-04-97
REIC SAMPLE #: 54450-2 **MATRIX:** LIQUID

PRIORITY POLLUTANT
VOLATILE ORGANIC COMPOUNDS (continued)

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
1,1,1-trichloroethane	ND	mg/l	624	0.005	09-08-97/TC
1,1,2-trichloroethane	0.025	mg/l	624	0.005	09-08-97/TC
trichloroethylene	1.32	mg/l	624	0.005	09-08-97/TC
vinyl chloride	1.56	mg/l	624	0.005	09-08-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	89
toluene-d8	105
4-bromofluorobenzene	96

ND - None Detected at MQL
MQL - Minimum Quantifying Level

POTESTA SAMPLE #: EW-6B WELL **DATE SAMPLED:** 09-04-97
REIC SAMPLE #: 54450-2 **MATRIX:** LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
2-chlorophenol	ND	mg/l	625	0.020	09-11-97/WP
2,4-dichlorophenol	ND	mg/l	625	0.020	09-11-97/WP
2,4-dimethylphenol	ND	mg/l	625	0.020	09-11-97/WP
4,6-dinitro-o-cresol (or 2-methyl-4,6-dinitrophenol)	ND	mg/l	625	0.020	09-11-97/WP
2,4-dinitrophenol	ND	mg/l	625	0.020	09-11-97/WP
2-nitrophenol	ND	mg/l	625	0.020	09-11-97/WP
4-nitrophenol	ND	mg/l	625	0.020	09-11-97/WP
p-chloro-m-cresol (or 4-chloro-3-methylphenol)	ND	mg/l	625	0.020	09-11-97/WP
pentachlorophenol	ND	mg/l	625	0.020	09-11-97/WP
phenol	ND	mg/l	625	0.020	09-11-97/WP
2,4,6-trichlorophenol	ND	mg/l	625	0.020	09-11-97/WP

Surrogates	% Recovery
2-fluorophenol	30
phenol-d6	29
2,4,6-tribromophenol	77

ND - None Detected at MQL
MQL - Minimum Quantifying Level

POTESTA SAMPLE #: EW-6B WELL **DATE SAMPLED:** 09-04-97
REIC SAMPLE #: 54450-2 **MATRIX:** LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-BASE/NEUTRAL EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
acenaphthene	ND	mg/l	625	0.010	09-11-97/WP
acenaphthylene	ND	mg/l	625	0.010	09-11-97/WP
anthracene	ND	mg/l	625	0.010	09-11-97/WP
benzidine	ND	mg/l	625	0.010	09-11-97/WP
benzo(a)anthracene	ND	mg/l	625	0.010	09-11-97/WP
benzo(a)pyrene	ND	mg/l	625	0.010	09-11-97/WP
3,4-benzofluoranthene (or benzo(b)fluoranthene)	ND	mg/l	625	0.010	09-11-97/WP
benzo(ghi)perylene	ND	mg/l	625	0.010	09-11-97/WP
benzo(k)fluoranthene	ND	mg/l	625	0.010	09-11-97/WP
bis(2-chloroethoxy)methane	ND	mg/l	625	0.010	09-11-97/WP
bis(2-chloroethyl) ether	0.028	mg/l	625	0.010	09-11-97/WP
bis(2-chloroisopropyl) ether	ND	mg/l	625	0.010	09-11-97/WP
bis(2-ethylhexyl)phthalate	ND	mg/l	625	0.010	09-11-97/WP
4-bromophenyl phenyl ether	ND	mg/l	625	0.010	09-11-97/WP
butylbenzyl phthalate	ND	mg/l	625	0.010	09-11-97/WP
2-chloronaphthalene	ND	mg/l	625	0.010	09-11-97/WP
4-chlorophenyl phenyl ether	ND	mg/l	625	0.010	09-11-97/WP
chrysene	ND	mg/l	625	0.010	09-11-97/WP
dibenzo(a,h)anthracene	ND	mg/l	625	0.010	09-11-97/WP

ND - None Detected at MQL
MQL - Minimum Quantifying Level

POTESTA SAMPLE #: EW-6B WELL **DATE SAMPLED:** 09-04-97
REIC SAMPLE #: 54450-2 **MATRIX:** LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-BASE/NEUTRAL EXTRACTABLES
(continued)

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
1,2-dichlorobenzene	ND	mg/l	625	0.010	09-11-97/WP
1,3-dichlorobenzene	ND	mg/l	625	0.010	09-11-97/WP
1,4-dichlorobenzene	ND	mg/l	625	0.010	09-11-97/WP
3,3'-dichlorobenzidine	ND	mg/l	625	0.010	09-11-97/WP
diethyl phthalate	ND	mg/l	625	0.010	09-11-97/WP
dimethyl phthalate	ND	mg/l	625	0.010	09-11-97/WP
di-n-butyl phthalate	ND	mg/l	625	0.010	09-11-97/WP
2,4-dinitrotoluene	ND	mg/l	625	0.010	09-11-97/WP
2,6-dinitrotoluene	ND	mg/l	625	0.010	09-11-97/WP
di-n-octyl phthalate	ND	mg/l	625	0.010	09-11-97/WP
1,2-diphenylhydrazine	ND	mg/l	625	0.010	09-11-97/WP
fluoranthene	ND	mg/l	625	0.010	09-11-97/WP
fluorene	ND	mg/l	625	0.010	09-11-97/WP
hexachlorobenzene	ND	mg/l	625	0.010	09-11-97/WP
hexachlorobutadiene	ND	mg/l	625	0.010	09-11-97/WP
hexachlorocyclopentadiene	ND	mg/l	625	0.010	09-11-97/WP
hexachloroethane	ND	mg/l	625	0.010	09-11-97/WP
indeno(1,2,3-cd)pyrene	ND	mg/l	625	0.010	09-11-97/WP
isophorone	ND	mg/l	625	0.010	09-11-97/WP
naphthalene	ND	mg/l	625	0.010	09-11-97/WP
nitrobenzene	ND	mg/l	625	0.010	09-11-97/WP
N-nitrosodimethylamine	ND	mg/l	625	0.010	09-11-97/WP
N-nitrosodi-n-propylamine	ND	mg/l	625	0.010	09-11-97/WP
N-nitrosodiphenylamine	ND	mg/l	625	0.010	09-11-97/WP

ND - None Deteced at MQL
MQL - Minimum Quantifying Level

POTESTA SAMPLE #: EW-6B WELL
REIC SAMPLE #: 54450-2
DATE SAMPLED: 09-04-97
MATRIX: LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-BASE/NEUTRAL EXTRACTABLES
(continued)

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenanthrene	ND	mg/l	625	0.010	09-11-97/WP
pyrene	ND	mg/l	625	0.010	09-11-97/WP
1,2,4-trichlorobenzene	ND	mg/l	625	0.010	09-11-97/WP

Surrogates	% Recovery
nitrobenzene-d5	68
2-fluorobiphenyl	71
p-terphenyl-d14	72

ND - None Detected at MQL
MQL - Minimum Quantifying Level

REIC 50784

CHAIN OF CUSTODY RECORD

NO. ..220

REIC Laboratory
225 Industrial Park Rd.
P.O. Box 286, Beaver, WV 25813
Phone: 304-255-2500 or 800-999-0105
FAX: 304-255-2572

CLIENT: POTESTA & ASSOCIATES
ADDRESS: 2300 MacCorkle AVE SE
CITY/STATE/ZIP: CHARLESTON, WV 25304
BILL TO: MONSANTO CO. 1 MONSANTO RD
CITY/STATE/ZIP: NITRO WV 25143

CONTACT PERSON: CHRIS GROSE
TELEPHONE/FAX: (304) 357-4990 / 49
SITE ID & STATE: MONSANTO CO., WV
PROJECT ID: 97025
SAMPLER: D. STOTTLEMYER

SAMPLE LOG AND ANALYSIS REQUEST

TURNAROUND TIME REQUIREMENTS
REGULAR:
*RUSH: ASAP
5-Day
3-Day
2-Day
1-Day
*Rush work needs prior Laboratory approval and will include surcharges

PRESERVATIVES
0 No Preservative
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide
6 Zinc Acetate
7 EDTA

PRESERVATIVE CODES

ANALYSIS REQUESTED & METHOD: PRIORITY POLLUTANTS VOLATILES & SEMI VOLATILES

SAMPLE ID	NO. & TYPE OF CONTAINERS	SAMPLING DATE / TIME	MATRIX	SAMPLE COMP / GRAB	PRIORITY POLLUTANTS VOLATILES & SEMI VOLATILES	COMMENTS
EW-7A	4-1L. AMBER 2-40ml	4-11-97 1030	H_2O	GRAB	X	3730 gal
LIFT STATION #1	4-1L. AMBER 2-40ml	4-11-97 1040	H_2O	GRAB	X	
EFFLUENT	4-1L. AMBER 2-40ml	4-11-97 1055	H_2O	GRAB	X	

4.1

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
[signature]	4-11-97 1155	[signature]	4-11-97 315	[signature]	4-11 440	Juanita Rettie	4-1 4:

Special Requests:

Shipment: Hand-Del: Courier: UPS: FedEx: Shipment Date: FAX Results: Y N

MONSANTO SAMPLE #: EW-7A
REIC SAMPLE #: 50784-1

DATE SAMPLED: 04-11-97
MATRIX: LIQUID

PRIORITY POLLUTANT
VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
acrolein	ND	mg/l	624	0.250	04-15-97/TC
acrylonitrile	ND	mg/l	624	0.250	04-15-97/TC
benzene	0.027	mg/l	624	0.025	04-15-97/TC
bromoform	ND	mg/l	624	0.025	04-15-97/TC
carbon tetrachloride	ND	mg/l	624	0.025	04-15-97/TC
chlorobenzene	0.453	mg/l	624	0.025	04-15-97/TC
chlorodibromomethane	ND	mg/l	624	0.025	04-15-97/TC
chloroethane	ND	mg/l	624	0.025	04-15-97/TC
2-chloroethyl vinyl ether	ND	mg/l	624	0.025	04-15-97/TC
chloroform	ND	mg/l	624	0.025	04-15-97/TC
cis-1,3-dichloropropylene	ND	mg/l	624	0.025	04-15-97/TC
dichlorobromomethane	ND	mg/l	624	0.025	04-15-97/TC
1,1-dichloroethane	ND	mg/l	624	0.025	04-15-97/TC
1,2-dichloroethane	ND	mg/l	624	0.025	04-15-97/TC
1,1-dichloroethylene	ND	mg/l	624	0.025	04-15-97/TC
1,2-dichloropropane	ND	mg/l	624	0.025	04-15-97/TC
ethylbenzene	0.203	mg/l	624	0.025	04-15-97/TC
methyl bromide	ND	mg/l	624	0.025	04-15-97/TC
methyl chloride	ND	mg/l	624	0.025	04-15-97/TC
methylene chloride	ND	mg/l	624	0.025	04-15-97/TC
1,1,2,2-tetrachloroethane	ND	mg/l	624	0.025	04-15-97/TC
tetrachloroethylene	ND	mg/l	624	0.025	04-15-97/TC
toluene	0.102	mg/l	624	0.025	04-15-97/TC
trans-1,2-dichloroethylene	3.47	mg/l	624	0.025	04-15-97/TC
trans-1,3-dichloropropylene	ND	mg/l	624	0.025	04-15-97/TC

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: EW-7A **DATE SAMPLED:** 04-11-97
REIC SAMPLE #: 50784-1 **MATRIX:** LIQUID

PRIORITY POLLUTANT
VOLATILE ORGANIC COMPOUNDS (continued)

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
1,1,1-trichloroethane	ND	mg/l	624	0.025	04-15-97/TC
1,1,2-trichloroethane	ND	mg/l	624	0.025	04-15-97/TC
trichloroethylene	3.40	mg/l	624	0.025	04-15-97/TC
vinyl chloride	0.063	mg/l	624	0.025	04-15-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	107
toluene-d8	89
4-bromofluorobenzene	95

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: EW-7A
REIC SAMPLE #: 50784-1

DATE SAMPLED: 04-11-97
MATRIX: LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
2-chlorophenol	ND	mg/l	625	0.020	04-15-97/WP
2,4-dichlorophenol	0.062	mg/l	625	0.020	04-15-97/WP
2,4-dimethylphenol	ND	mg/l	625	0.020	04-15-97/WP
4,6-dinitro-o-cresol (or 2-methyl-4,6-dinitrophenol)	ND	mg/l	625	0.020	04-15-97/WP
2,4-dinitrophenol	ND	mg/l	625	0.020	04-15-97/WP
2-nitrophenol	ND	mg/l	625	0.020	04-15-97/WP
4-nitrophenol	ND	mg/l	625	0.020	04-15-97/WP
p-chloro-m-cresol (or 4-chloro-3-methylphenol)	ND	mg/l	625	0.020	04-15-97/WP
pentachlorophenol	ND	mg/l	625	0.020	04-15-97/WP
phenol	ND	mg/l	625	0.020	04-15-97/WP
2,4,6-trichlorophenol	ND	mg/l	625	0.020	04-15-97/WP

Surrogates	% Recovery
2-fluorophenol	40
phenol-d6	24
2,4,6-tribromophenol	75

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: EW-7A
REIC SAMPLE #: 50784-1

DATE SAMPLED: 04-11-97
MATRIX: LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-BASE/NEUTRAL EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
acenaphthene	ND	mg/l	625	0.010	04-15-97/WP
acenaphthylene	ND	mg/l	625	0.010	04-15-97/WP
anthracene	ND	mg/l	625	0.010	04-15-97/WP
benzidine	ND	mg/l	625	0.010	04-15-97/WP
benzo(a)anthracene	ND	mg/l	625	0.010	04-15-97/WP
benzo(a)pyrene	ND	mg/l	625	0.010	04-15-97/WP
3,4-benzofluoranthene (or benzo(b)fluoranthene)	ND	mg/l	625	0.010	04-15-97/WP
benzo(ghi)perylene	ND	mg/l	625	0.010	04-15-97/WP
benzo(k)fluoranthene	ND	mg/l	625	0.010	04-15-97/WP
bis(2-chloroethoxy)methane	ND	mg/l	625	0.010	04-15-97/WP
bis(2-chloroethyl) ether	ND	mg/l	625	0.010	04-15-97/WP
bis(2-chloroisopropyl) ether	ND	mg/l	625	0.010	04-15-97/WP
bis(2-ethylhexyl)phthalate	ND	mg/l	625	0.010	04-15-97/WP
4-bromophenyl phenyl ether	ND	mg/l	625	0.010	04-15-97/WP
butylbenzyl phthalate	ND	mg/l	625	0.010	04-15-97/WP
2-chloronaphthalene	ND	mg/l	625	0.010	04-15-97/WP
4-chlorophenyl phenyl ether	ND	mg/l	625	0.010	04-15-97/WP
chrysene	ND	mg/l	625	0.010	04-15-97/WP
dibenzo(a,h)anthracene	ND	mg/l	625	0.010	04-15-97/WP
1,2-dichlorobenzene	ND	mg/l	625	0.010	04-15-97/WP
1,3-dichlorobenzene	ND	mg/l	625	0.010	04-15-97/WP
1,4-dichlorobenzene	ND	mg/l	625	0.010	04-15-97/WP
3,3'-dichlorobenzidine	ND	mg/l	625	0.010	04-15-97/WP
diethyl phthalate	ND	mg/l	625	0.010	04-15-97/WP

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: EW-7A
REIC SAMPLE #: 50784-1

DATE SAMPLED: 04-11-97
MATRIX: LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-BASE/NEUTRAL EXTRACTABLES
(continued)

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
dimethyl phthalate	ND	mg/l	625	0.010	04-15-97/WP
di-n-butyl phthalate	ND	mg/l	625	0.010	04-15-97/WP
2,4-dinitrotoluene	ND	mg/l	625	0.010	04-15-97/WP
2,6-dinitrotoluene	ND	mg/l	625	0.010	04-15-97/WP
di-n-octyl phthalate	ND	mg/l	625	0.010	04-15-97/WP
1,2-diphenylhydrazine	ND	mg/l	625	0.010	04-15-97/WP
fluoranthene	ND	mg/l	625	0.010	04-15-97/WP
fluorene	ND	mg/l	625	0.010	04-15-97/WP
hexachlorobenzene	ND	mg/l	625	0.010	04-15-97/WP
hexachlorobutadiene	ND	mg/l	625	0.010	04-15-97/WP
hexachlorocyclopentadiene	ND	mg/l	625	0.010	04-15-97/WP
hexachloroethane	ND	mg/l	625	0.010	04-15-97/WP
indeno(1,2,3-cd)pyrene	ND	mg/l	625	0.010	04-15-97/WP
isophorone	0.063	mg/l	625	0.010	04-15-97/WP
naphthalene	0.079	mg/l	625	0.010	04-15-97/WP
nitrobenzene	ND	mg/l	625	0.010	04-15-97/WP
N-nitrosodimethylamine	ND	mg/l	625	0.010	04-15-97/WP
N-nitrosodi-n-propylamine	ND	mg/l	625	0.010	04-15-97/WP
N-nitrosodiphenylamine	ND	mg/l	625	0.010	04-15-97/WP
phenanthrene	ND	mg/l	625	0.010	04-15-97/WP
pyrene	ND	mg/l	625	0.010	04-15-97/WP
1,2,4-trichlorobenzene	ND	mg/l	625	0.010	04-15-97/WP

Surrogates	% Recovery
nitrobenzene-d5	70
2-fluorobiphenyl	59
p-terphenyl-d14	69

ND - None Detected at MQL
MQL - Minimum Quantifying Level

REIC

CHAIN OF CUSTODY RECORD NO. 5 173

REIC Laboratory
225 Industrial Park Rd.
P.O. Box 286, Beaver, WV 25813
Phone: 304-255-2500 or 800-999-0105
FAX: 304-255-2572

CLIENT: MONSANTO CO.
ADDRESS: 1 MONSANTO ROAD
CITY/STATE/ZIP: NITRO, WV
BILL TO: MONSANTO CO
CITY/STATE/ZIP: NITRO WV

CONTACT PERSON: CHRIS GROSE
TELEPHONE/FAX: (304) 357-4990 / 4988
SITE ID & STATE: MONSANTO TCE, WV
PROJECT ID: 97025
SAMPLER: D. STOTTLEMYER

SAMPLE LOG AND ANALYSIS REQUEST

TURNAROUND TIME REQUIREMENTS
REGULAR: X
*RUSH: ___ 5-Day ___ 3-Day ___ 2-Day ___ 1-Day
*Rush work needs prior Laboratory approval and will include surcharges

PRESERVATIVES
0 No Preservative
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide
6 Zinc Acetate
7 EDTA

NOTE PRESERVATIVES →
PRESERVATIVE CODES

ANALYSIS REQUESTED & METHOD: MODIFIED PRIORITY POLL. - NO METALS, NO DIOXIN

SAMPLE ID	NO. & TYPE OF CONTAINERS	SAMPLING DATE / TIME	MATRIX	SAMPLE COMP / GRAB	MODIFIED PRIORITY POLL. - NO METALS, NO DIOXIN	COMMENTS
EW-7B	1-1L	7-16-97 1425	H_2O	GRAB	X	
EW-7B L.S.#1	1-1L	7-16-97 2000	H_2O	GRAB	X	
EW-7B	2-40ml	7-16-97 1425	H_2O	GRAB	X	
EW-7B L.S.#1	2-40ml	7-16-97 2000	H_2O	GRAB	X	

* PLEASE FAX A COPY OF THE RESULTS TO CHRIS GROSE 357-4988

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
[signature]	6-17-97 0645	[signature]	6-17-97 10:40	[signature]	7-17 1/45	[signature]	7-17-97 [illegible]

Special Requests:
Sample Condition: Good? Y N
Temperature Upon Arrival 3°C
Shipment: Hand-Del: Courier: UPS: FedEx:
Shipment Date: FAX Results: Y N

MONSANTO SAMPLE #: EW-7B
REIC SAMPLE #: 53315-1

DATE SAMPLED: 07-16-97
MATRIX: LIQUID

VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
benzene	0.059	mg/l	8240B	0.010	07-23-97/TL
trichloroethene	0.942	mg/l	8240B	0.010	07-23-97/TL
chlorobenzene	ND	mg/l	8240B	0.010	07-23-97/TL

Surrogates	% Recovery
1,2-dichloroethane-d4	107
toluene-d8	98
4-bromofluorobenzene	93

SEMIVOLATILE ORGANIC COMPOUNDS - ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
phenol	ND	mg/l	8270B	0.020	07-22-97/WP
2-chlorophenol	ND	mg/l	8270B	0.020	07-22-97/WP
2-nitrophenol	ND	mg/l	8270B	0.020	07-22-97/WP
2,4-dimethylphenol	ND	mg/l	8270B	0.020	07-22-97/WP
2,4-dichlorophenol	ND	mg/l	8270B	0.020	07-22-97/WP
4-chloro-3-methylphenol	ND	mg/l	8270B	0.020	07-22-97/WP
2,4,6-trichlorophenol	ND	mg/l	8270B	0.020	07-22-97/WP
2,4-dinitrophenol	ND	mg/l	8270B	0.020	07-22-97/WP
4-nitrophenol	ND	mg/l	8270B	0.020	07-22-97/WP
2-methyl-4,6-dinitrophenol	ND	mg/l	8270B	0.020	07-22-97/WP
pentachlorophenol	ND	mg/l	8270B	0.020	07-22-97/WP
o-cresol	ND	mg/l	8270B	0.020	07-22-97/WP
m,p-cresol	ND	mg/l	8270B	0.020	07-22-97/WP

Surrogates	% Recovery
2-fluorophenol	25
phenol-d6	28
2,4,6-tribromophenol	26

ND - None Detected at MQL
MQL - Minimum Quantifying Level

REIC

CHAIN OF CUSTODY RECORD NO. 930

REIC Laboratory
225 Industrial Park Rd.
P.O. Box 286, Beaver, WV 25813
Phone: 304-255-2500 or 800-999-0105
FAX: 304-255-2572

CLIENT: MONSANTO CO. / TONY TUK
ADDRESS: 1 MONSANTO ROAD
CITY/STATE/ZIP: NITRO WV
BILL TO: MONSANTO CO.
CITY/STATE/ZIP: NITRO, WV

CONTACT PERSON: CHRIS GROSE
TELEPHONE/FAX: (304) 357-4990 / 357-4
SITE ID & STATE: MONSANTO CO. TCE
PROJECT ID: MONSANTO CO. TCE
SAMPLER: D. STOTTLEMYER

SAMPLE LOG AND ANALYSIS REQUEST

TURNAROUND TIME REQUIREMENTS
REGULAR: X
*RUSH: ___ 5-Day ___ 3-Day ___ 2-Day ___ 1-Day
*Rush work needs prior Laboratory approval and will include surcharges

PRESERVATIVES
0 No Preservative
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide
6 Zinc Acetate
7 EDTA

PRESERVATIVE CODES

ANALYSIS REQUESTED & METHOD

SAMPLE ID	NO. & TYPE OF CONTAINERS	SAMPLING DATE / TIME	MATRIX	SAMPLE COMP / GRAB	PRIORITY POLLUTANTS	VOLATILE ORGANICS	ACID EXTRACTABLES	BASE/NEUTRAL EXT									COMMENTS
LIFT STATION #1	2-1L AMBER 2-40 ml	3-20-97 1245	H_2O	GRAB	✓	✓	✓	✓									
WWTP EFFLUENT	2-1L AMBER 2-40 ml	3-20-97 1305	H_2O	GRAB	✓	✓	✓	✓									
EW-8	2-1L AMBER 2-40 ml	3-19-97 1620	H_2O	GRAB	✓	✓	✓	✓									

N/A

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
[signature]	3-20-97 13:20	Chris Grose	3-20-97 15:20	Chris Grose	3-21-97 1000	[signature]	3-2 10:0

Special Requests:

Shipment: Hand-Del: Courier: UPS: FedEx:

Shipment Date: FAX Results: Y N

MONSANTO SAMPLE #: EW-8
REIC SAMPLE #: 50233-3

DATE SAMPLED: 03-19-97
MATRIX: LIQUID

PRIORITY POLLUTANT
VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
acrolein	ND	mg/l	624	0.050	03-25-97/TC
acrylonitrile	ND	mg/l	624	0.050	03-25-97/TC
benzene	0.014	mg/l	624	0.005	03-25-97/TC
bromoform	ND	mg/l	624	0.005	03-25-97/TC
carbon tetrachloride	0.880	mg/l	624	0.005	03-25-97/TC
chlorobenzene	ND	mg/l	624	0.005	03-25-97/TC
chlorodibromomethane	ND	mg/l	624	0.005	03-25-97/TC
chloroethane	ND	mg/l	624	0.005	03-25-97/TC
2-chloroethyl vinyl ether	ND	mg/l	624	0.005	03-25-97/TC
chloroform	0.401	mg/l	624	0.005	03-25-97/TC
cis-1,3-dichloropropylene	ND	mg/l	624	0.005	03-25-97/TC
dichlorobromomethane	0.006	mg/l	624	0.005	03-25-97/TC
1,1-dichloroethane	ND	mg/l	624	0.005	03-25-97/TC
1,2-dichloroethane	ND	mg/l	624	0.005	03-25-97/TC
1,1-dichloroethylene	ND	mg/l	624	0.005	03-25-97/TC
1,2-dichloropropane	ND	mg/l	624	0.005	03-25-97/TC
ethylbenzene	ND	mg/l	624	0.005	03-25-97/TC
methyl bromide	ND	mg/l	624	0.005	03-25-97/TC
methyl chloride	ND	mg/l	624	0.005	03-25-97/TC
methylene chloride	0.008	mg/l	624	0.005	03-25-97/TC
1,1,2,2-tetrachloroethane	ND	mg/l	624	0.005	03-25-97/TC
tetrachloroethylene	ND	mg/l	624	0.005	03-25-97/TC
toluene	0.025	mg/l	624	0.005	03-25-97/TC
trans-1,2-dichloroethylene	0.060	mg/l	624	0.005	03-25-97/TC
trans-1,3-dichloropropylene	ND	mg/l	624	0.005	03-25-97/TC

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: EW-8
REIC SAMPLE #: 50233-3

DATE SAMPLED: 03-19-97
MATRIX: LIQUID

PRIORITY POLLUTANT
VOLATILE ORGANIC COMPOUNDS (continued)

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
1,1,1-trichloroethane	ND	mg/l	624	0.005	03-25-97/TC
1,1,2-trichloroethane	ND	mg/l	624	0.005	03-25-97/TC
trichloroethylene	0.602	mg/l	624	0.005	03-25-97/TC
vinyl chloride	ND	mg/l	624	0.005	03-25-97/TC

Surrogates	% Recovery
1,2-dichloroethane-d4	92
toluene-d8	98
4-bromofluorobenzene	92

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: EW-8
REIC SAMPLE #: 50233-3

DATE SAMPLED: 03-19-97
MATRIX: LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-ACID EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
2-chlorophenol	ND	mg/l	625	0.020	03-28-97/WP
2,4-dichlorophenol	ND	mg/l	625	0.020	03-28-97/WP
2,4-dimethylphenol	ND	mg/l	625	0.020	03-28-97/WP
4,6-dinitro-o-cresol (or 2-methyl-4,6-dinitrophenol)	ND	mg/l	625	0.020	03-28-97/WP
2,4-dinitrophenol	ND	mg/l	625	0.020	03-28-97/WP
2-nitrophenol	ND	mg/l	625	0.020	03-28-97/WP
4-nitrophenol	ND	mg/l	625	0.020	03-28-97/WP
p-chloro-m-cresol (or 4-chloro-3-methylphenol)	ND	mg/l	625	0.020	03-28-97/WP
pentachlorophenol	ND	mg/l	625	0.020	03-28-97/WP
phenol	ND	mg/l	625	0.020	03-28-97/WP
2,4,6-trichlorophenol	ND	mg/l	625	0.020	03-28-97/WP

Surrogates	% Recovery
2-fluorophenol	52
phenol-d6	35
2,4,6-tribromophenol	53

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: EW-8 **DATE SAMPLED:** 03-19-97
REIC SAMPLE #: 50233-3 **MATRIX:** LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-BASE/NEUTRAL EXTRACTABLES

PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
acenaphthene	ND	mg/l	625	0.010	03-28-97/WP
acenaphthylene	ND	mg/l	625	0.010	03-28-97/WP
anthracene	ND	mg/l	625	0.010	03-28-97/WP
benzidine	ND	mg/l	625	0.010	03-28-97/WP
benzo(a)anthracene	ND	mg/l	625	0.010	03-28-97/WP
benzo(a)pyrene	ND	mg/l	625	0.010	03-28-97/WP
3,4-benzofluoranthene (or benzo(b)fluoranthene)	ND	mg/l	625	0.010	03-28-97/WP
benzo(ghi)perylene	ND	mg/l	625	0.010	03-28-97/WP
benzo(k)fluoranthene	ND	mg/l	625	0.010	03-28-97/WP
bis(2-chloroethoxy)methane	ND	mg/l	625	0.010	03-28-97/WP
bis(2-chloroethyl) ether	ND	mg/l	625	0.010	03-28-97/WP
bis(2-chloroisopropyl) ether	ND	mg/l	625	0.010	03-28-97/WP
bis(2-ethylhexyl)phthalate	ND	mg/l	625	0.010	03-28-97/WP
4-bromophenyl phenyl ether	ND	mg/l	625	0.010	03-28-97/WP
butylbenzyl phthalate	ND	mg/l	625	0.010	03-28-97/WP
2-chloronaphthalene	ND	mg/l	625	0.010	03-28-97/WP
4-chlorophenyl phenyl ether	ND	mg/l	625	0.010	03-28-97/WP
chrysene	ND	mg/l	625	0.010	03-28-97/WP
dibenzo(a,h)anthracene	ND	mg/l	625	0.010	03-28-97/WP
1,2-dichlorobenzene	ND	mg/l	625	0.010	03-28-97/WP
1,3-dichlorobenzene	ND	mg/l	625	0.010	03-28-97/WP
1,4-dichlorobenzene	ND	mg/l	625	0.010	03-28-97/WP
3,3'-dichlorobenzidine	ND	mg/l	625	0.010	03-28-97/WP
diethyl phthalate	ND	mg/l	625	0.010	03-28-97/WP

ND - None Detected at MQL
MQL - Minimum Quantifying Level

MONSANTO SAMPLE #: EW-8
REIC SAMPLE #: 50233-3

DATE SAMPLED: 03-19-97
MATRIX: LIQUID

PRIORITY POLLUTANT
SEMIVOLATILE ORGANIC COMPOUNDS-BASE/NEUTRAL EXTRACTABLES
(continued)

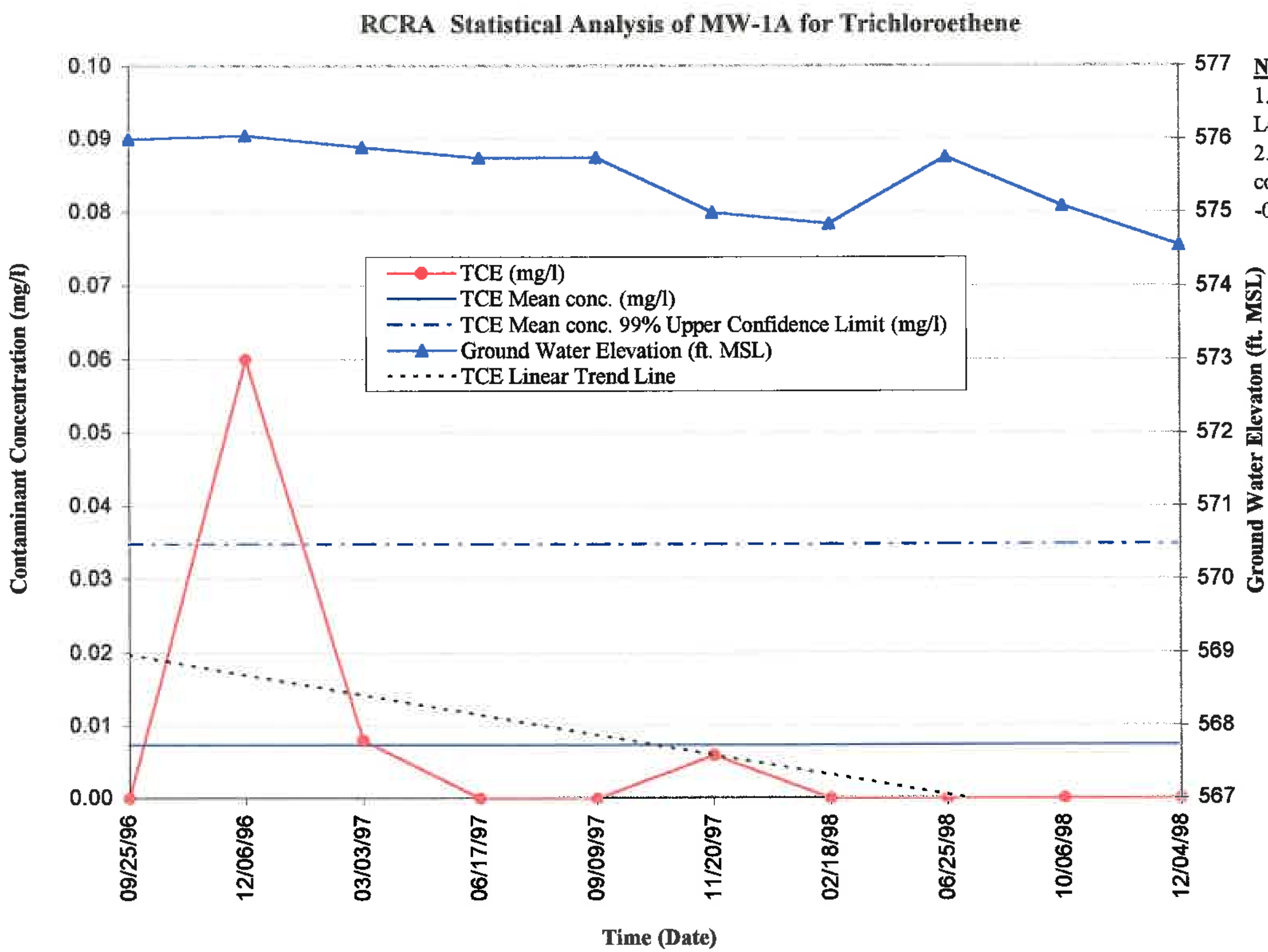
PARAMETER	RESULT	UNIT	METHOD	MQL	ANALYZED/BY
dimethyl phthalate	ND	mg/l	625	0.010	03-28-97/WP
di-n-butyl phthalate	ND	mg/l	625	0.010	03-28-97/WP
2,4-dinitrotoluene	ND	mg/l	625	0.010	03-28-97/WP
2,6-dinitrotoluene	ND	mg/l	625	0.010	03-28-97/WP
di-n-octyl phthalate	ND	mg/l	625	0.010	03-28-97/WP
1,2-diphenylhydrazine	ND	mg/l	625	0.010	03-28-97/WP
fluoranthene	ND	mg/l	625	0.010	03-28-97/WP
fluorene	ND	mg/l	625	0.010	03-28-97/WP
hexachlorobenzene	ND	mg/l	625	0.010	03-28-97/WP
hexachlorobutadiene	ND	mg/l	625	0.010	03-28-97/WP
hexachlorocyclopentadiene	ND	mg/l	625	0.010	03-28-97/WP
hexachloroethane	ND	mg/l	625	0.010	03-28-97/WP
indeno(1,2,3-cd)pyrene	ND	mg/l	625	0.010	03-28-97/WP
isophorone	ND	mg/l	625	0.010	03-28-97/WP
naphthalene	ND	mg/l	625	0.010	03-28-97/WP
nitrobenzene	ND	mg/l	625	0.010	03-28-97/WP
N-nitrosodimethylamine	ND	mg/l	625	0.010	03-28-97/WP
N-nitrosodi-n-propylamine	ND	mg/l	625	0.010	03-28-97/WP
N-nitrosodiphenylamine	0.012	mg/l	625	0.010	03-28-97/WP
phenanthrene	ND	mg/l	625	0.010	03-28-97/WP
pyrene	ND	mg/l	625	0.010	03-28-97/WP
1,2,4-trichlorobenzene	ND	mg/l	625	0.010	03-28-97/WP

Surrogates	% Recovery
nitrobenzene-d5	90
2-fluorobiphenyl	60
p-terphenyl-d14	109

ND - None Detected at MQL
MQL - Minimum Quantifying Level

APPENDIX I

TCE Hot Spot Area
Monitoring Well Trends



Notes:
1. The TCE Permit Level is 0.005 mg/l.
2. The lower 99% confidence interval is -0.0199 mg/l.

RCRA Statistical Analysis of MW-1A for Trichloroethene

Date	TCE (mg/l)	TCE Mean conc. (mg/l)	TCE Mean conc. 99% Upper Confidence Limit (mg/l)	TCE Mean conc. 99% Lower Confidence Limit (mg/l)	Ground Water Elevation (ft. MSL)
09/25/96	ND	0.0074	0.0347	-0.0199	576
12/06/96	0.060	0.0074	0.0347	-0.0199	576.05
03/03/97	0.008	0.0074	0.0347	-0.0199	575.89
06/17/97	ND	0.0074	0.0347	-0.0199	575.74
09/09/97	ND	0.0074	0.0347	-0.0199	575.75
11/20/97	0.006	0.0074	0.0347	-0.0199	575
02/18/98	ND	0.0074	0.0347	-0.0199	574.85
06/25/98	ND	0.0074	0.0347	-0.0199	575.76
10/06/98	ND	0.0074	0.0347	-0.0199	575.09
12/04/98	ND	0.0074	0.0347	-0.0199	574.56

Abbreviations:
mg/l = milligrams per liter

Statistical Calculations:

Mean, x= 0.007400 mg/l

Standard Deviation, s= 0.0306159 mg/l

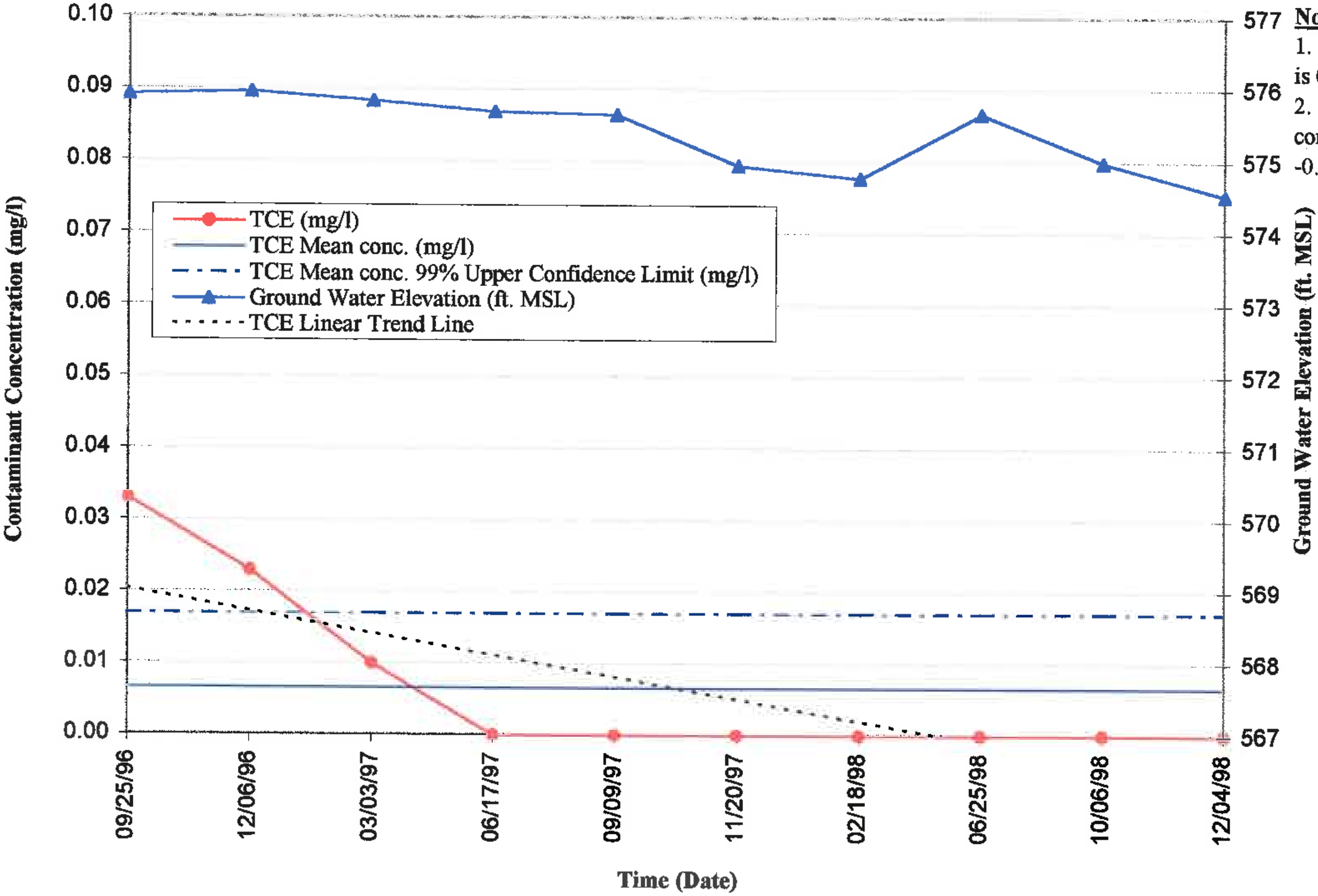
Degrees of Freedom = 9

t Distribution, t0.99 = 2.821

Confidence Interval (upper limit)= 0.03471 mg/l

Confidence Interval (lower limit)= -0.01991 mg/l

RCRA Statistical Analysis of MW-1B for Trichloroethene



Notes:
1. The TCE Permit Level is 0.005 mg/l.
2. The lower 99% confidence interval is -0.00369 mg/l.

RCRA Statistical Analysis of MW-1B for Trichloroethene

Date	TCE (mg/l)	TCE Mean conc. (mg/l)	TCE Mean conc. 99% Upper Confidence Limit (mg/l)	TCE Mean conc. 99% Lower Confidence Limit (mg/l)	Ground Water Elevation (ft. MSL)
09/25/96	0.033	0.0066	0.0169	-0.0037	575.91
12/06/96	0.023	0.0066	0.0169	-0.0037	575.95
03/03/97	0.010	0.0066	0.0169	-0.0037	575.83
06/17/97	ND	0.0066	0.0169	-0.0037	575.68
09/09/97	ND	0.0066	0.0169	-0.0037	575.64
11/20/97	ND	0.0066	0.0169	-0.0037	574.94
02/18/98	ND	0.0066	0.0169	-0.0037	574.77
06/25/98	ND	0.0066	0.0169	-0.0037	575.66
10/06/98	ND	0.0066	0.0169	-0.0037	574.99
12/04/98	ND	0.0066	0.0169	-0.0037	574.54

Abbreviations:

mg/l = milligrams per liter

Statistical Calculations:

Mean, x= 0.006600 mg/l

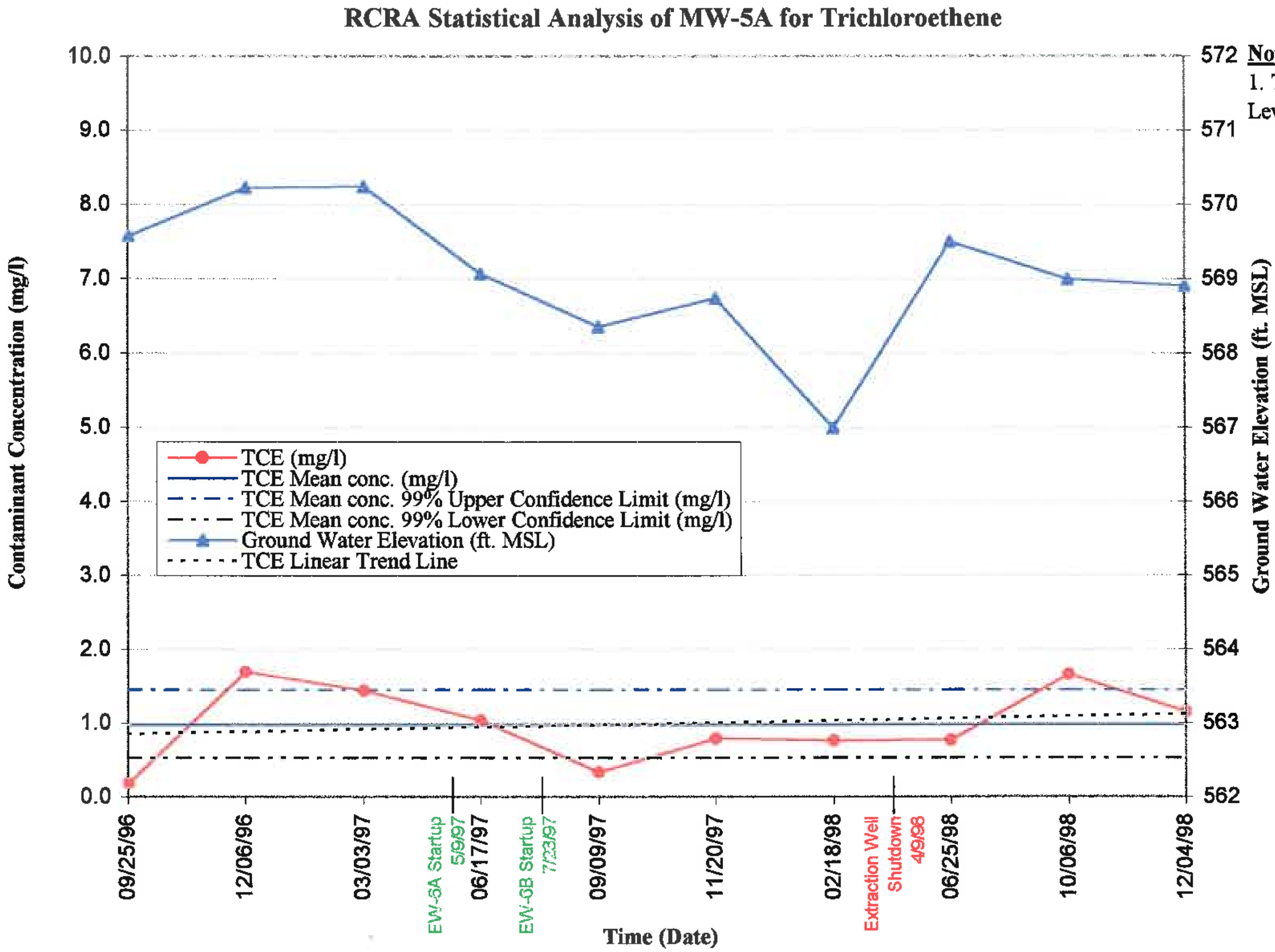
Standard Deviation, s= 0.011532563 mg/l

Degrees of Freedom = 9

t Distribution, t0.99 = 2.821

Confidence Interval (upper limit)= 0.01689 mg/l

Confidence Interval (lower limit)= -0.00369 mg/l



Notes:
1. The TCE Permit Level is 0.005 mg/l.

RCRA Statistical Analysis of MW-5A for Trichloroethene

Date	TCE (mg/l)	TCE Mean conc. (mg/l)	TCE Mean conc. 99% Upper Confidence Limit (mg/l)	TCE Mean conc. 99% Lower Confidence Limit (mg/l)	Ground Water Elevation (ft. MSL)
09/25/96	0.186	0.9891	1.4505	0.5277	569.58
12/06/96	1.700	0.9891	1.4505	0.5277	570.23
03/03/97	1.450	0.9891	1.4505	0.5277	570.25
06/17/97	1.040	0.9891	1.4505	0.5277	569.07
09/09/97	0.341	0.9891	1.4505	0.5277	568.36
11/20/97	0.797	0.9891	1.4505	0.5277	568.75
02/18/98	0.771	0.9891	1.4505	0.5277	567
06/25/98	0.776	0.9891	1.4505	0.5277	569.51
10/06/98	1.67	0.9891	1.4505	0.5277	569
12/04/98	1.16	0.9891	1.4505	0.5277	568.91

Abbreviations:

mg/l = milligrams per liter

Statistical Calculations:

Mean, x= 0.989100 mg/l

Standard Deviation, s= 0.517270067 mg/l

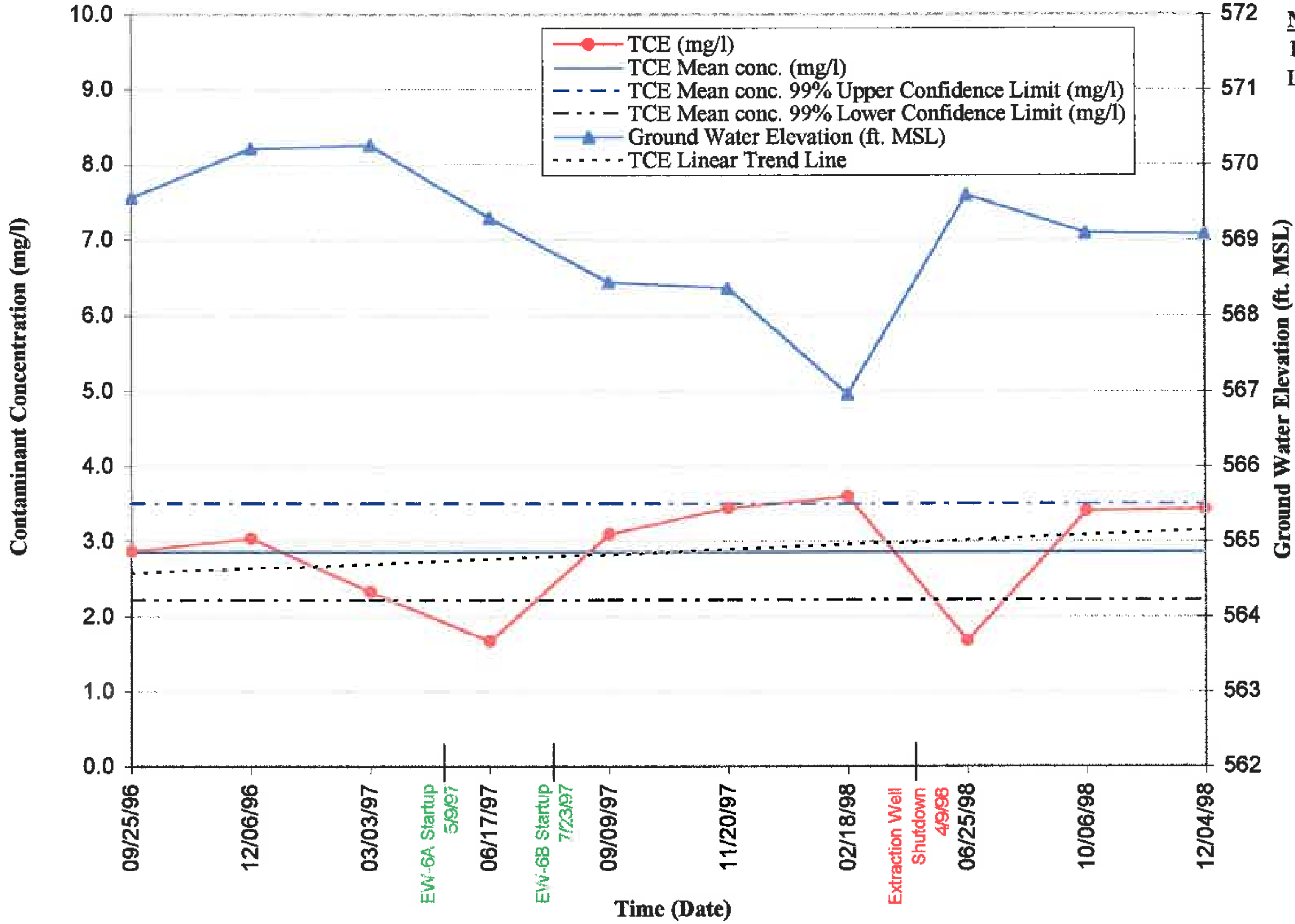
Degrees of Freedom = 9

t Distribution, t0.99 = 2.821

Confidence Interval (upper limit)= 1.45055 mg/l

Confidence Interval (lower limit)= 0.52765 mg/l

RCRA Statistical Analysis of MW-5B for Trichloroethene



Notes:

1. The TCE Permit Level is 0.005 mg/l.

RCRA Statistical Analysis of MW-5B for Trichloroethene

Date	TCE (mg/l)	TCE Mean conc. (mg/l)	TCE Mean conc. 99% Upper Confidence Limit (mg/l)	TCE Mean conc. 99% Lower Confidence Limit (mg/l)	Ground Water Elevation (ft. MSL)
09/25/96	2.870	2.8580	3.4980	2.2180	569.56
12/06/96	3.040	2.8580	3.4980	2.2180	570.22
03/03/97	2.330	2.8580	3.4980	2.2180	570.26
06/17/97	1.680	2.8580	3.4980	2.2180	569.3
09/09/97	3.100	2.8580	3.4980	2.2180	568.45
11/20/97	3.440	2.8580	3.4980	2.2180	568.37
02/18/98	3.600	2.8580	3.4980	2.2180	566.97
06/25/98	1.690	2.8580	3.4980	2.2180	569.6
10/06/98	3.400	2.8580	3.4980	2.2180	569.1
12/04/98	3.430	2.8580	3.4980	2.2180	569.09

Abbreviations:

mg/l = milligrams per liter

Statistical Calculations:

Mean, x= 2.858000 mg/l

Standard Deviation, s= 0.717461575 mg/l

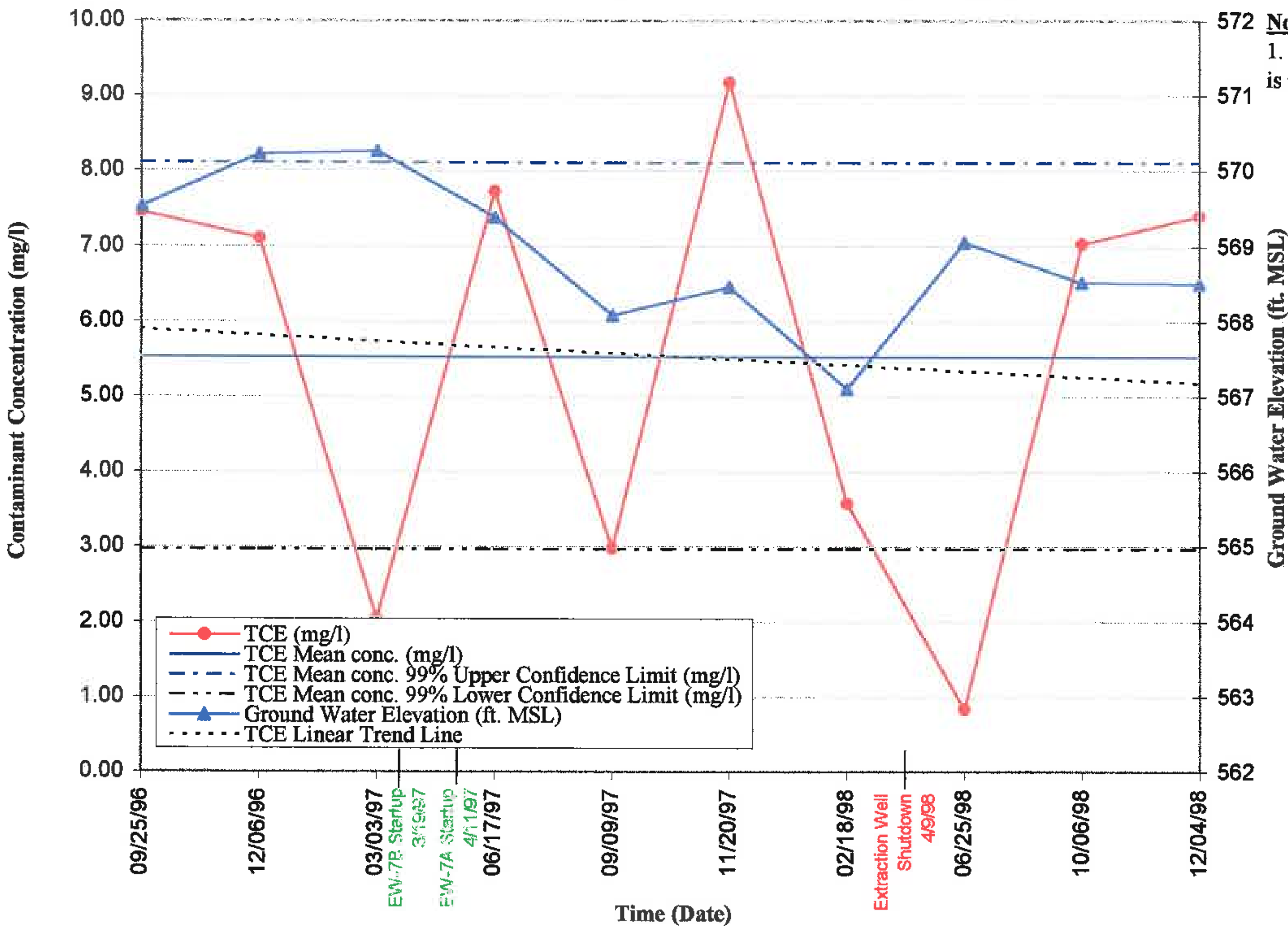
Degrees of Freedom = 9

t Distribution, t0.99 = 2.821

Confidence Interval (upper limit)= 3.49803 mg/l

Confidence Interval (lower limit)= 2.21797 mg/l

RCRA Statistical Analysis of MW-20A for Trichloroethene



Notes:
1. The TCE Permit Level is 0.005 mg/l.

RCRA Statistical Analysis of MW-20A for Trichloroethene

Date	TCE (mg/l)	TCE Mean conc. (mg/l)	TCE Mean conc. 99% Upper Confidence Limit (mg/l)	TCE Mean conc. 99% Lower Confidence Limit (mg/l)	Ground Water Elevation (ft. MSL)
09/25/96	7.450	5.5366	8.1051	2.9681	569.53
12/06/96	7.110	5.5366	8.1051	2.9681	570.23
03/03/97	2.050	5.5366	8.1051	2.9681	570.26
06/17/97	7.730	5.5366	8.1051	2.9681	569.39
09/09/97	2.980	5.5366	8.1051	2.9681	568.09
11/20/97	9.180	5.5366	8.1051	2.9681	568.47
02/18/98	3.580	5.5366	8.1051	2.9681	567.11
06/25/98	0.836	5.5366	8.1051	2.9681	569.06
10/06/98	7.040	5.5366	8.1051	2.9681	568.53
12/04/98	7.410	5.5366	8.1051	2.9681	568.51

Abbreviations:

mg/l = milligrams per liter

Statistical Calculations:

Mean, x= 5.536600 mg/l

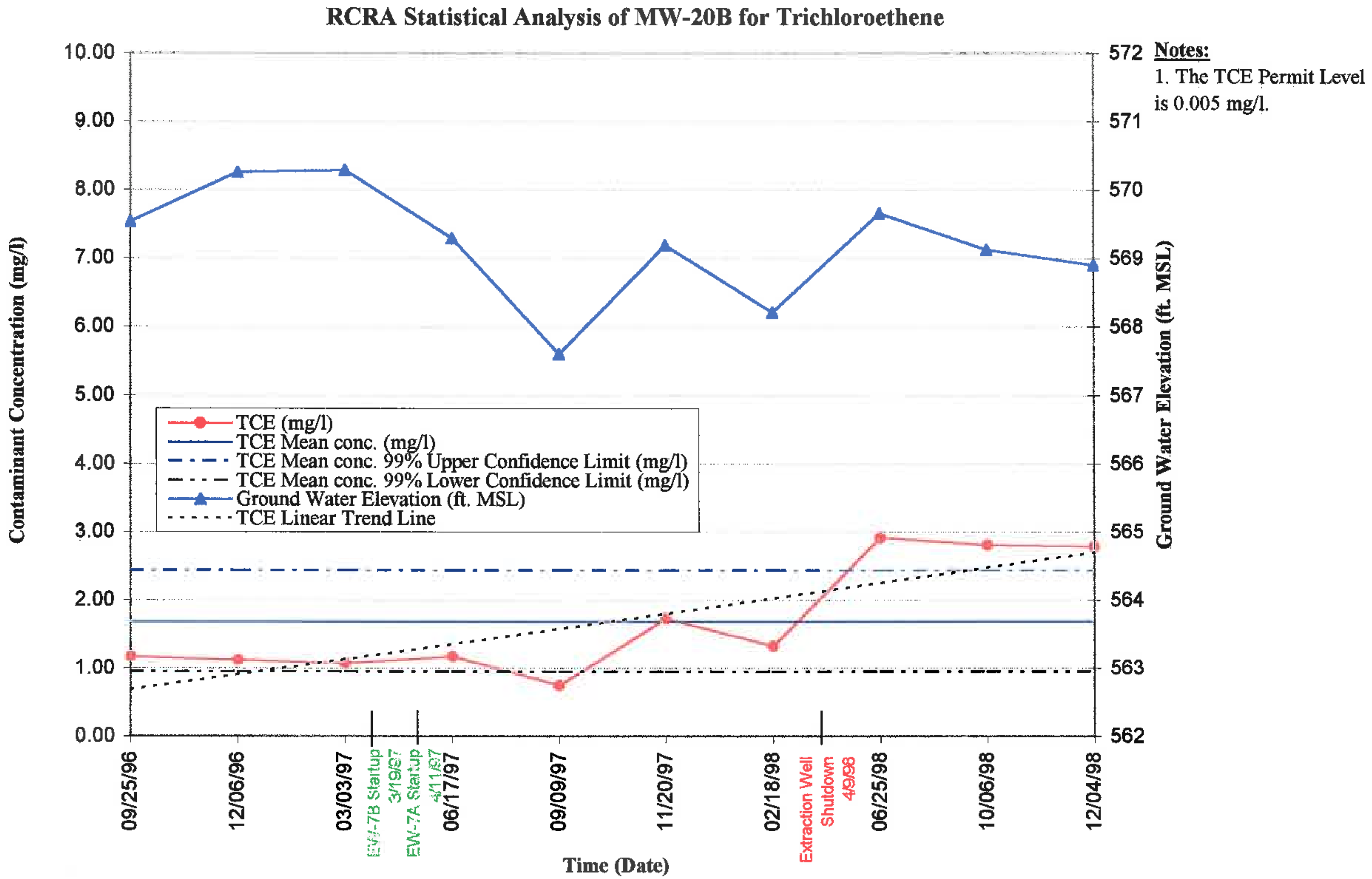
Standard Deviation, s= 2.879205145 mg/l

Degrees of Freedom = 9

t Distribution, t0.99 = 2.821

Confidence Interval (upper limit)= 8.10508 mg/l

Confidence Interval (lower limit)= 2.96812 mg/l



RCRA Statistical Analysis of MW-20B for Trichloroethene
Contaminant Concentration (mg/l)
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
Ground Water Elevation (ft. MSL)
572
571
570
569
568
567
566
565
564
563
562
TCE (mg/l)
TCE Mean conc. (mg/l)
TCE Mean conc. 99% Upper Confidence Limit (mg/l)
TCE Mean conc. 99% Lower Confidence Limit (mg/l)
Ground Water Elevation (ft. MSL)
TCE Linear Trend Line
09/25/96
12/06/96
03/03/97
EW-7B Startup 3/19/97
EW-7A Startup 4/11/97
06/17/97
09/09/97
11/20/97
02/18/98
Extraction Well Shutdown 4/9/98
06/25/98
10/06/98
12/04/98
Time (Date)
Notes:
1. The TCE Permit Level is 0.005 mg/l.

RCRA Statistical Analysis of MW-20B for Trichloroethene

Date	TCE (mg/l)	TCE Mean conc. (mg/l)	TCE Mean conc. 99% Upper Confidence Limit (mg/l)	TCE Mean conc. 99% Lower Confidence Limit (mg/l)	Ground Water Elevation (ft. MSL)
09/25/96	1.180	1.6915	2.4313	0.9517	569.54
12/06/96	1.130	1.6915	2.4313	0.9517	570.26
03/03/97	1.080	1.6915	2.4313	0.9517	570.29
06/17/97	1.180	1.6915	2.4313	0.9517	569.3
09/09/97	0.755	1.6915	2.4313	0.9517	567.61
11/20/97	1.740	1.6915	2.4313	0.9517	569.2
02/18/98	1.330	1.6915	2.4313	0.9517	568.22
06/25/98	2.920	1.6915	2.4313	0.9517	569.66
10/06/98	2.810	1.6915	2.4313	0.9517	569.13
12/04/98	2.790	1.6915	2.4313	0.9517	568.91

Abbreviations:

mg/l = milligrams per liter

Statistical Calculations:

Mean, x= 1.691500 mg/l

Standard Deviation, s= 0.829290359 mg/l

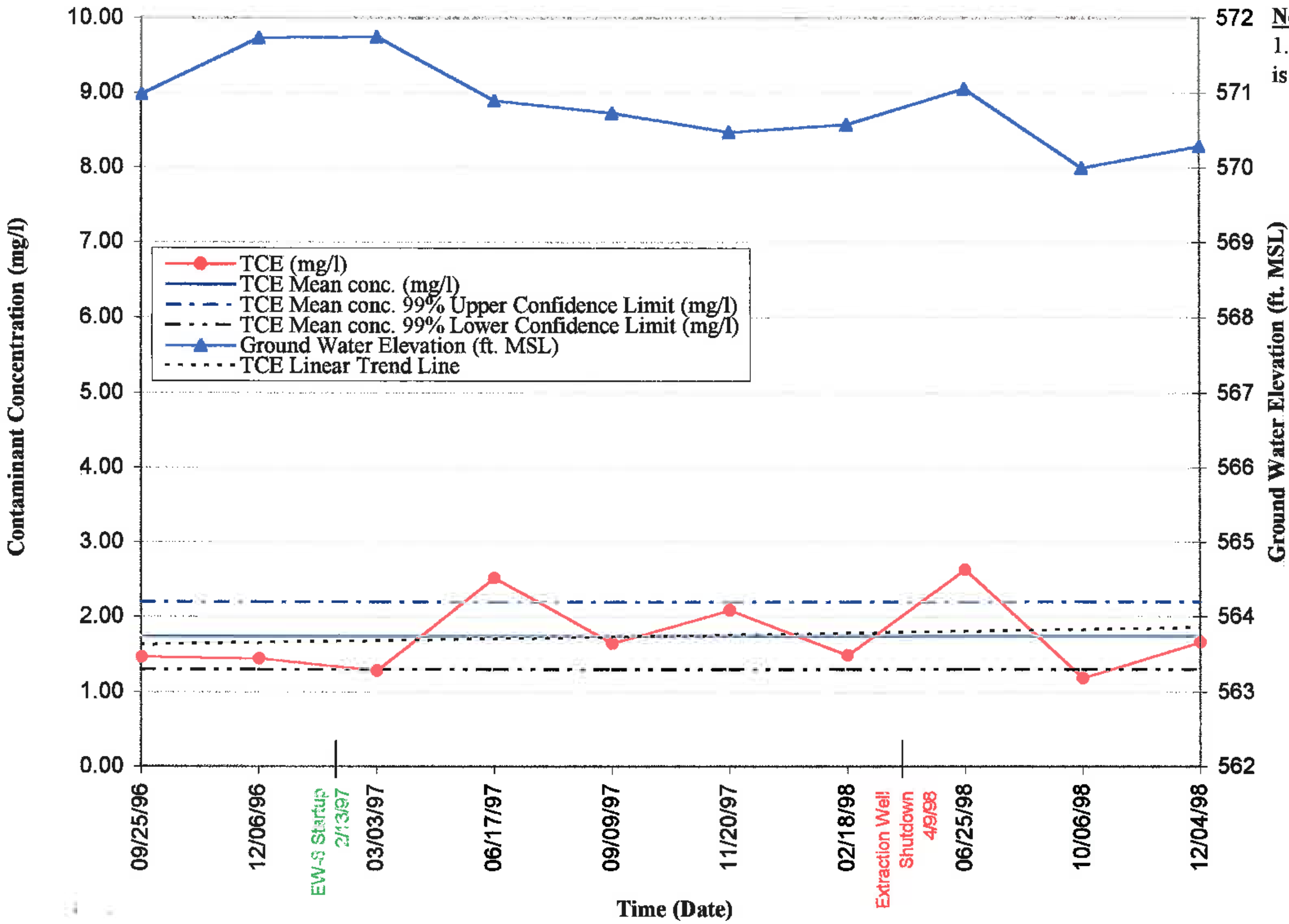
Degrees of Freedom = 9

t Distribution, t0.99 = 2.821

Confidence Interval (upper limit)= 2.43129 mg/l

Confidence Interval (lower limit)= 0.95171 mg/l

RCRA Statistical Analysis of MW-23A for Trichloroethene



Notes:
1. The TCE Permit Level is 0.005 mg/l.

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RCRA Statistical Analysis of MW-23A for Trichloroethene

Date	TCE (mg/l)	TCE Mean conc. (mg/l)	TCE Mean conc. 99% Upper Confidence Limit (mg/l)	TCE Mean conc. 99% Lower Confidence Limit (mg/l)	Ground Water Elevation (ft. MSL)
09/25/96	1.470	1.7450	2.1921	1.2979	570.99
12/06/96	1.450	1.7450	2.1921	1.2979	571.74
03/03/97	1.290	1.7450	2.1921	1.2979	571.75
06/17/97	2.520	1.7450	2.1921	1.2979	570.9
09/09/97	1.650	1.7450	2.1921	1.2979	570.73
11/20/97	2.090	1.7450	2.1921	1.2979	570.48
02/18/98	1.490	1.7450	2.1921	1.2979	570.58
06/25/98	2.630	1.7450	2.1921	1.2979	571.06
10/06/98	1.190	1.7450	2.1921	1.2979	570
12/04/98	1.670	1.7450	2.1921	1.2979	570.29

Abbreviations:

mg/l = milligrams per liter

Statistical Calculations:

Mean, x= 1.745000 mg/l

Standard Deviation, s= 0.501137595 mg/l

Degrees of Freedom = 9

t Distribution, t0.99 = 2.821

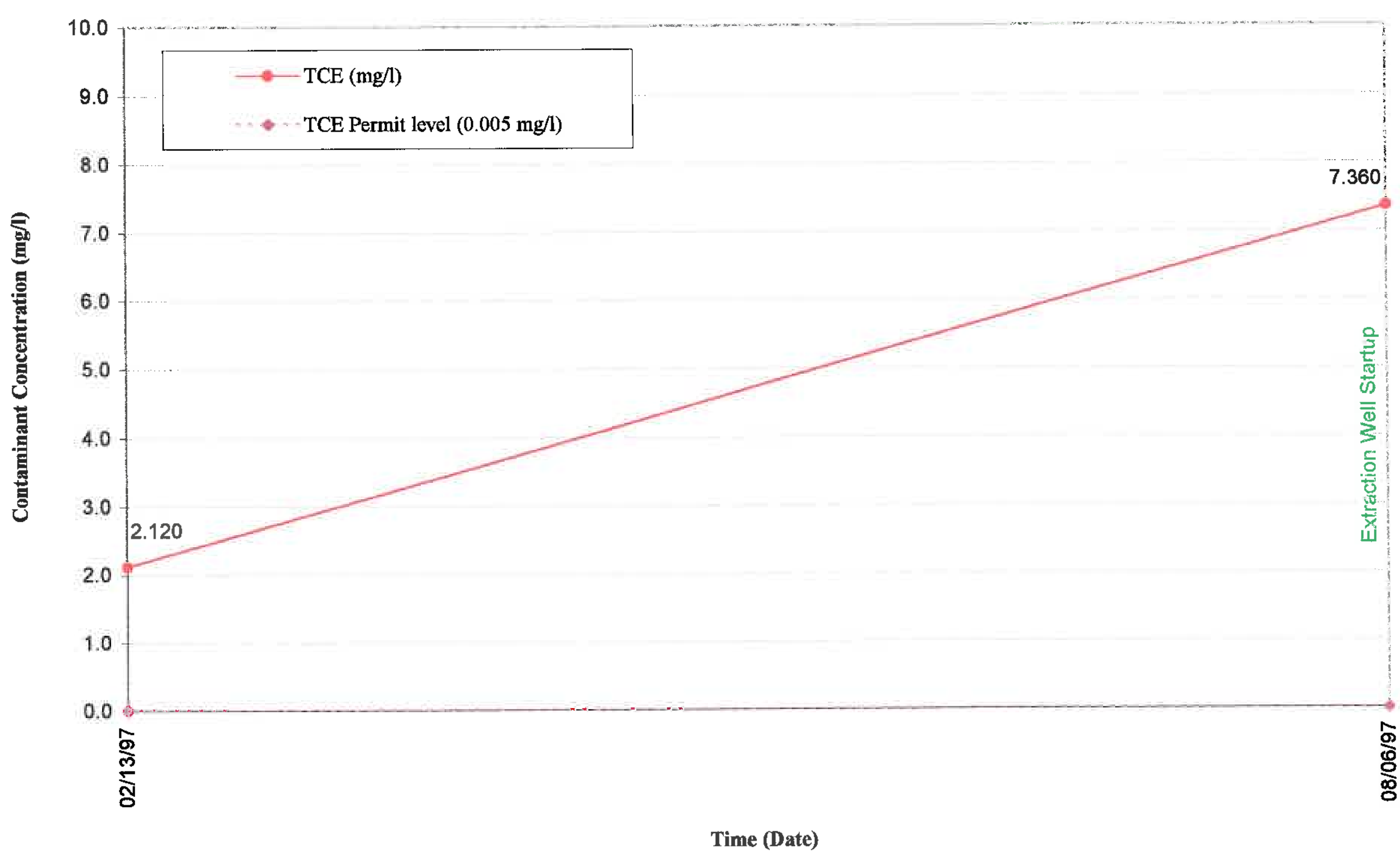
Confidence Interval (upper limit)= 2.19205 mg/l

Confidence Interval (lower limit)= 1.29795 mg/l

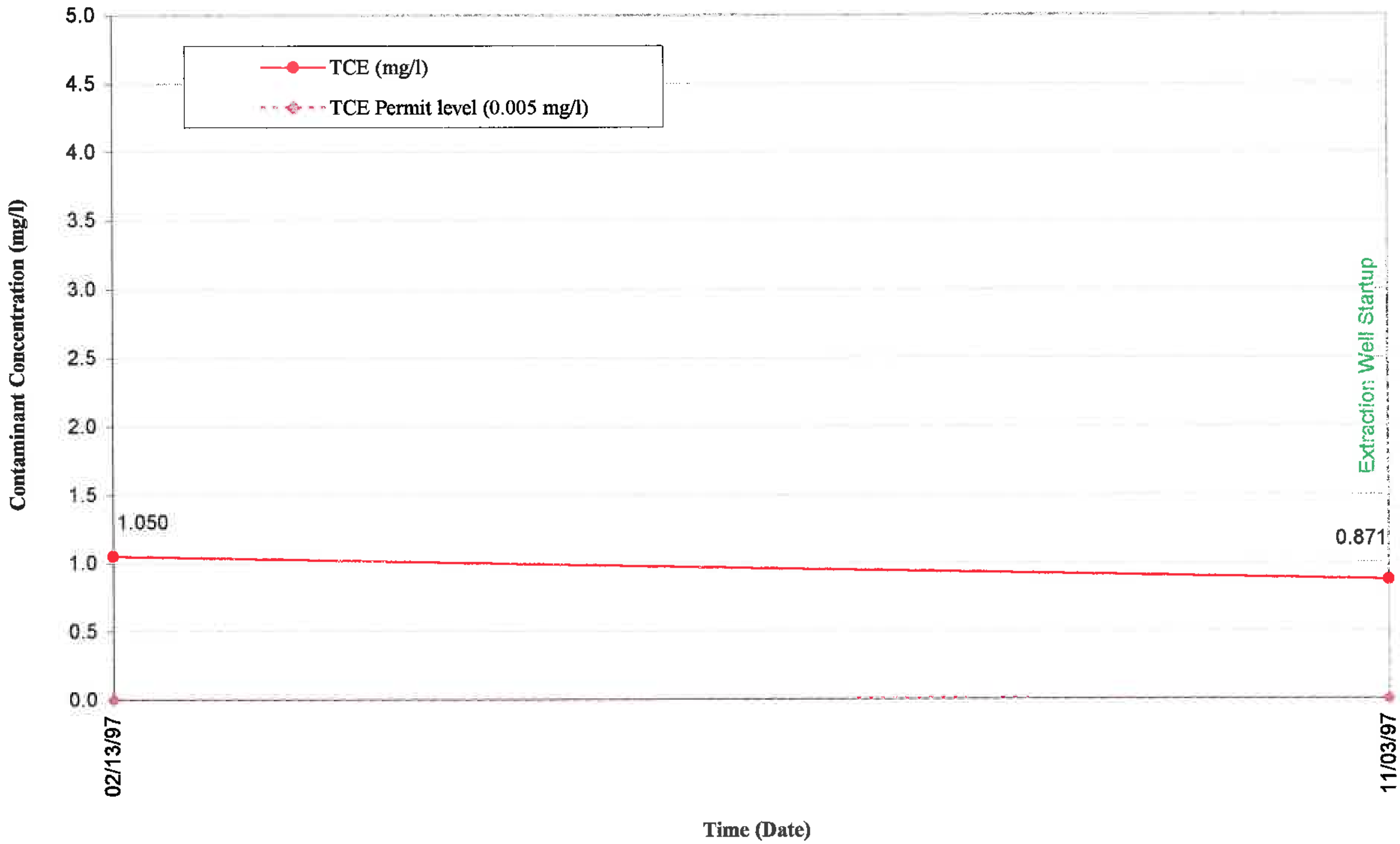
APPENDIX J

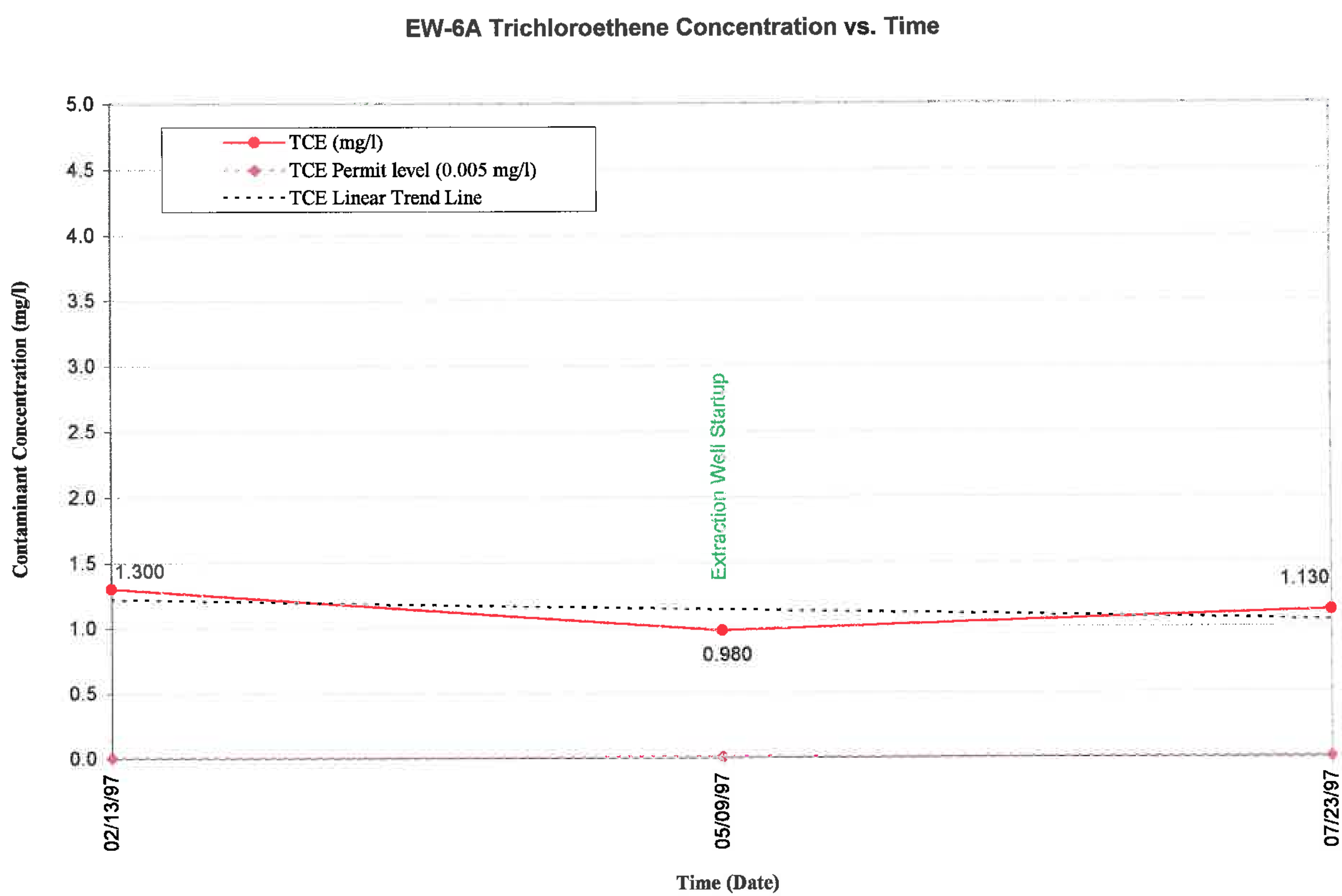
TCE Hot Spot Area
Extraction Well Trends

EW-5A Trichloroethene Concentration vs. Time

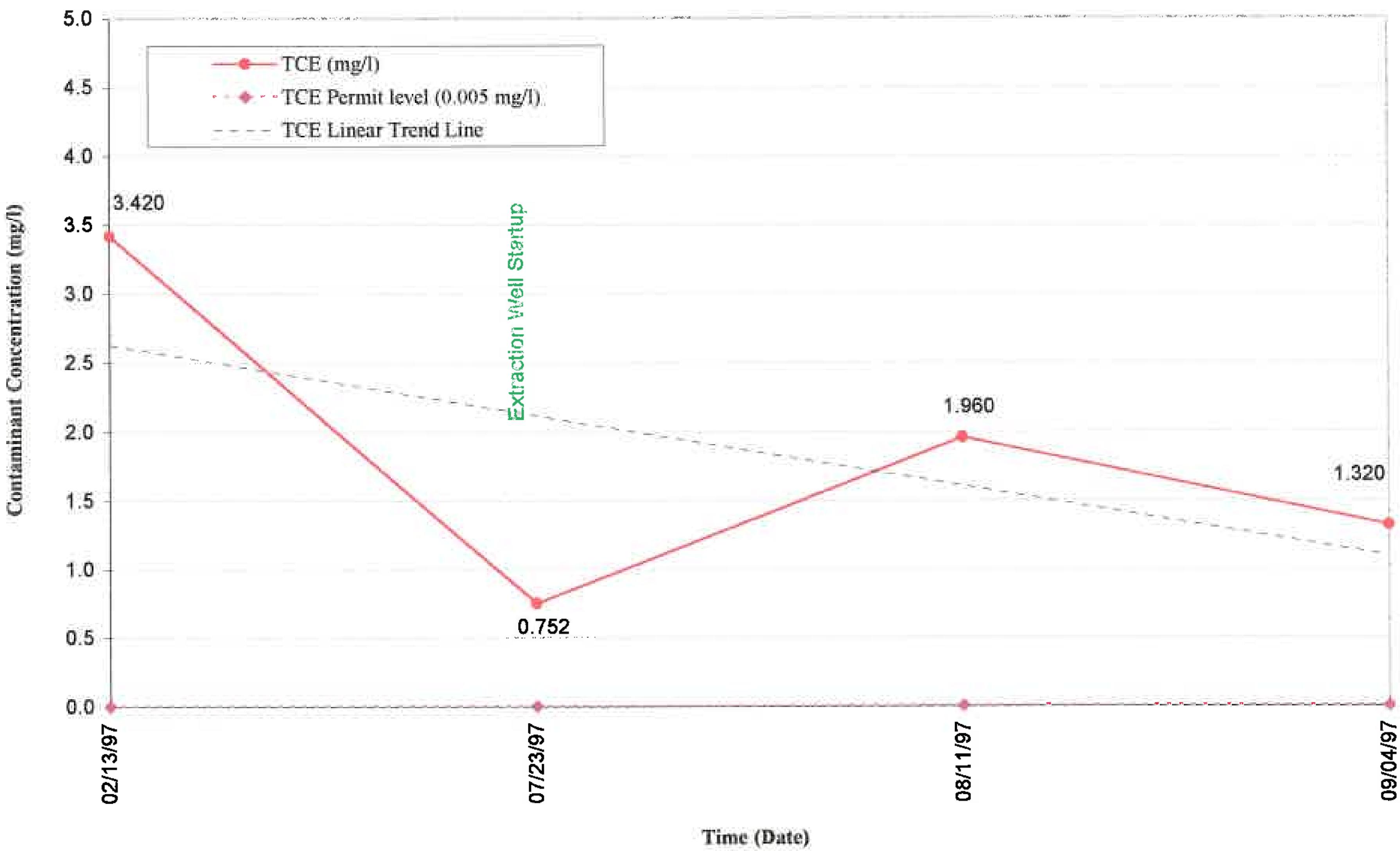


EW-5B Trichloroethene Concentration vs. Time

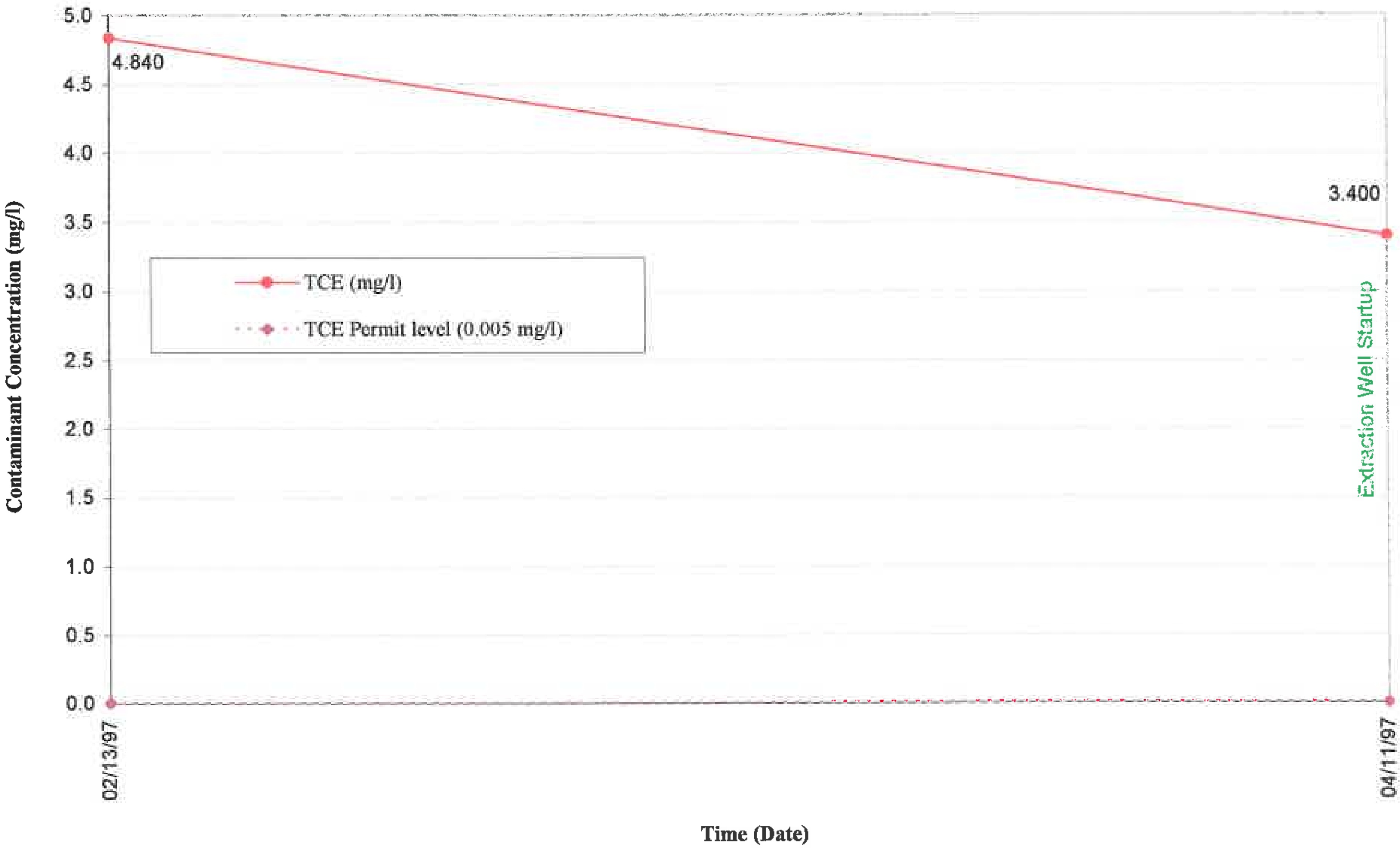



EW-6A Trichloroethene Concentration vs. Time
TCE (mg/l)
TCE Permit level (0.005 mg/l)
TCE Linear Trend Line
Contaminant Concentration (mg/l)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1.300
0.980
1.130
Extraction Well Startup
02/13/97
05/09/97
07/23/97
Time (Date)

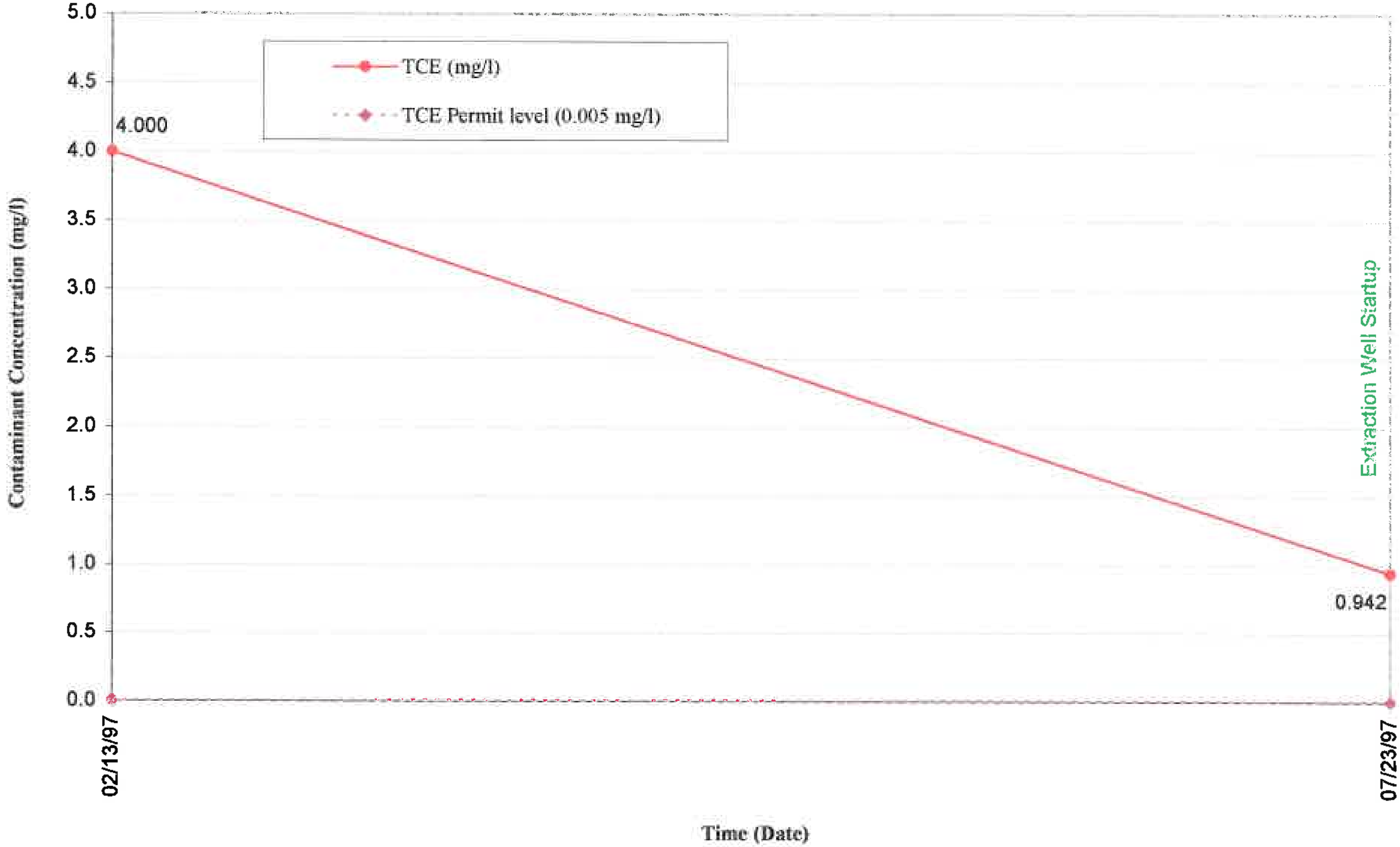
EW-6B Trichloroethene Concentration vs. Time



EW-7A Trichloroethene Concentration vs. Time



EW-7B Trichloroethene Concentration vs. Time



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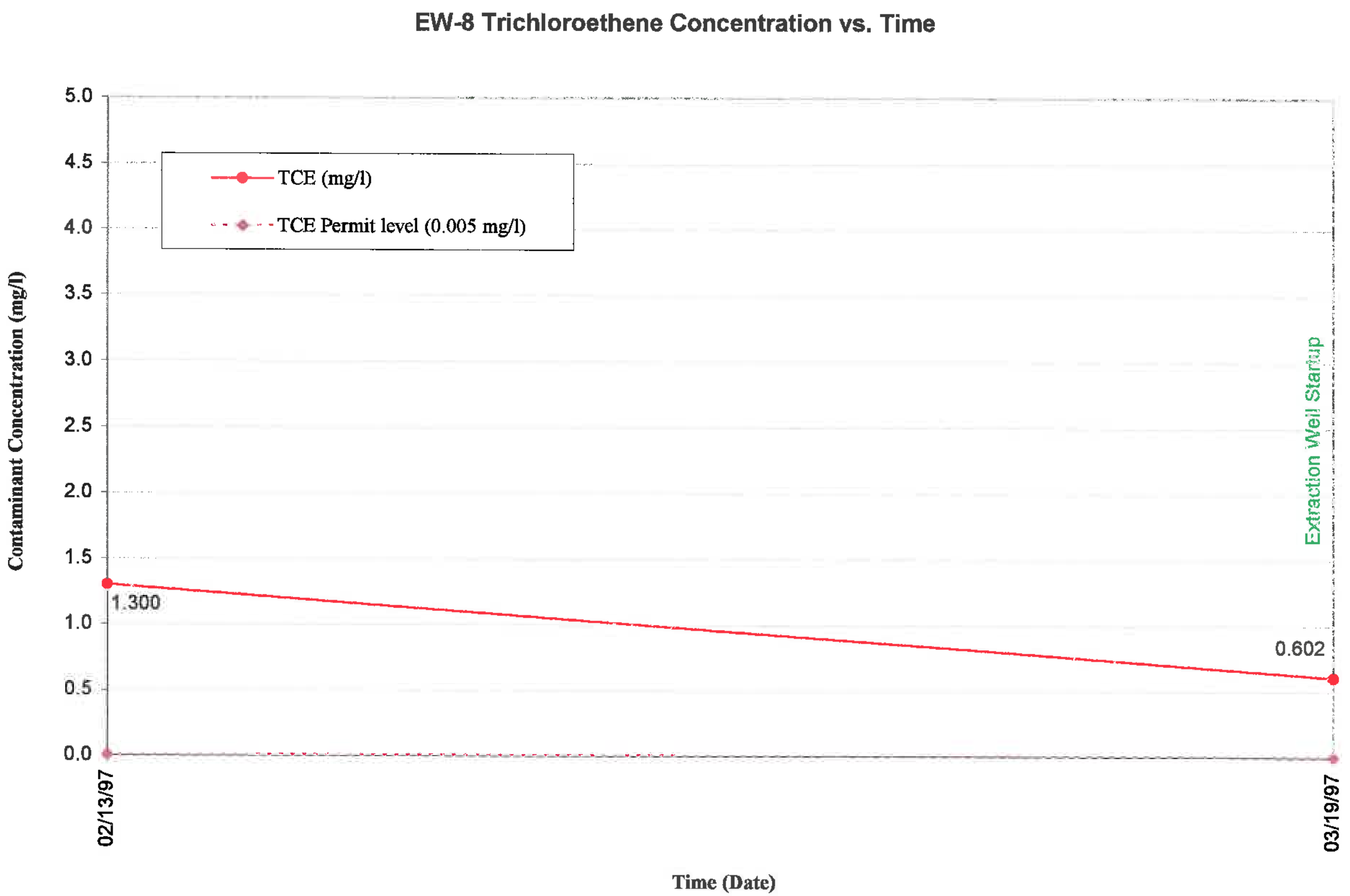

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APPENDIX K

CITY OF NITRO DUMP AREA
BENCH SCALE BIOSPARGE STUDY

Biodegradation Studies for Reduction of Methyl- and Chlorophenols in Groundwater at the Flexsys Facility Nitro, West Virginia

Summary Report

Prepared for:

Monsanto Company
1 Monsanto Road
Nitro, West Virginia

Prepared by:

Envirogen, Inc.
4100 Quakerbridge Road
Lawrenceville, NJ 08648

January 23, 1997

1.0 SUMMARY OF STUDY AND EXPERIMENTAL RESULTS

ENVIROGEN conducted a laboratory feasibility study to evaluate the aerobic biodegradability of chloro- and methylphenols that are affecting the soils and groundwater in the vicinity of monitor well WT-14A at the Flexsys Facility Nitro, West Virginia (Site). The study was conducted over a five week period using soil slurry reactors so as to optimize the rate of contaminant biodegradation. The soil slurries were incubated within the temperatures range of 12°C to 17°C, this represents the in situ groundwater temperature at the Site. The extent of chloro- and methylphenol biodegradation was monitored by quantifying the depletion of the contaminants from the slurry mixture after the 5 weeks incubated period. A total of 5 triplicate test conditions and 1 triplicate killed control were evaluated. The 5 test conditions were designed to test the effect of: 1) no nutrient amendments, 2) inorganic (i.e., nitrogen and phosphorus) amendments, 3) benzoate amendments, 4) benzoate and inorganic amendments, and 5) inoculating with a genetically-engineered bacterium, Pseudomonas sp. B13 SN45RE. This bacterium was engineered specifically to degrade mixtures of chloro- and methylphenols that the literature indicated may often exhibit toxicity towards microbial communities (Rojo et al., 1987).

The objectives of the biotreatability study were to:

1. Determine the feasibility of using aerobic biodegradation to reduce the mass of Constituents of Concern (COCs) and TOC in the vicinity of WT-14A.

2. Evaluate the presence of environmental inhibitors or limitations to microbial activity (by characterizing: pH, temperature, nutrient limitations, and indigenous bacterial populations), and;

3. Determine the benefits of nutrient and carbon source amendment, as these components can be limiting to the biodegradation process if unavailable to the soil bacteria.

The experimental results show that the chloro- and methylphenols at the Nitro, West Virginia site are amenable to biodegradation, and that none of the environmental parameters present at the Site will adversely limit the extent of biodegradation that is possible. The laboratory biodegradability studies have shown that oxygenation of the site soils and groundwaters is by itself sufficient to attain a 76% reduction in the mass of total phenol over the 5 week test period. The in situ rate of degradation of the COCs is however expected to be less than that observed in the laboratory study as a result of the optimal conditions provided in the soil slurry reactors.

2.0 COLLECTION AND TRANSPORTATION OF SOIL AND GROUNDWATER SAMPLES

Two (2) quarts of soil and four (4) quarts of groundwater were collected to conduct the biodegradation studies. The soil sample was obtained (by Roux Associates) in the vicinity of well WT-14A, and the groundwater sample was collected (by Roux Associates) from well WT-14A. The protocols outlined below were provided as guidelines for sample collection and shipping.

2.1 Soil Sampling

- A split spoon sampling tool was decontaminated by washing the spoon with deterrent, rinsed with water, and sprayed with ethanol and allowed to dry before sample collection.

- The spoon was driven to the water table level for collection of the COC-containing soils.

- Sample transfer from the sampling spoon to the sampling jars was completed immediately after retrieving the sample so as to prevent excessive volatile loss of the benzene component.

- Two (2), one-quart sample jars were completely filled (i.e., no head space) to minimize losses of the volatile components.

2.2 Water Sampling

- A grab sample of ground water was collected from the existing well, WT-14A.

- Transfer of the collected sample to sampling jars was completed as quickly as possible to prevent loss of benzene.

- One-quart sampling jars were filled to excess before capping to minimize headspace.

2.3 Sample Storage and Initial Characterization

- Immediately after collecting the soil and groundwater samples, the sealed sample jars were packed on ice for shipment to ENVIROGEN's treatability study laboratory in Lawrenceville, New Jersey.

- Upon arrival at the laboratory, the soil samples were homogenized by combining the jar contents into one large stainless steel carboy and mixing using a stainless steel spatula. To minimize volatile loss of benzene, the carboy was placed on ice and the contents were maintained at approximately 4°C. Mixing for homogeneity was considered complete after attaining visual homogeneity.

- Subsamples of the homogenized soil were analyzed for pH, nutrients (nitrogen and phosphorus), targeted phenols, and benzene. Additional subsamples were used to estimate microbial populations for total heterotrophs and phenol degraders. The analytical methods used are described below in Section 3.0.

- Upon arrival at the laboratory, the water samples were combined for mixing and re-dispensed to their original jars to ensure sample homogeneity. One subsample was analyzed for the targeted phenols and benzene.

3.0 ANALYTICAL METHODS

The subsamples of the groundwater and soil (after homogenization), and subsamples from the treated soil slurries (following the conduct of the study) were transferred immediately to glass vials, sealed and stored at 4°C until analyzed. All samples were analyzed within appropriate holding times for specific test parameters.

Teflon-lined, 40 ml VOA vials were filled (i.e., no headspace) with acidified site groundwater for benzene analysis, and a 1-Liter subsample of the groundwater was used for the phenols analysis. Approximately 40 g of the soils and treated soil slurries were transferred to 8 oz. jars for phenols analysis. Soil and treated slurry samples for benzene analysis were transferred to 20-ml VOA vials (with no headspace).

Phenols were quantified by using SW-846 Method 8270, and benzene was quantified using SW-846 Method 8020. Soil slurries from the benzoate-treated microcosms (flasks #10-15, see Section 4.2) were analyzed for benzoate levels at the completion of the study by using SW-846 Method 8270. The list below identifies the phenolic compounds that were quantified by Method 8270.

- 2-Methylphenol
- 4-Methylphenol
- 2,4-Dimethylphenol
- 2,4-Dichlorophenol
- 4-Chloro-3-methylphenol
- 2,4,6-Trichlorophenol

Twenty-gram soil subsamples were used for the determination of total organic carbon (TOC, Method 415.1) and for the determination of total heterotrophs and contaminant specific bacterial populations. The standard operating procedure (SOP) for the plate counts is provided in Appendix A. Phenol was used as the carbon source in the contaminant specific plates as it is the parent structure common to the major COCs.

For the determination of water soluble nutrients (nitrate, ammonia and phosphates) test kits from the HACH Company (Loveland, CO) were used. Test Kit PO-19 was used for determination of phosphates, Kit No. NI-8 for ammonia, and Kit No. NI-14 for the determination of nitrate. As the objective of nutrients level evaluation was to verify the presence of the water soluble nutrients, the test results were considered sufficient. The detection limit for each of the test kits is approximately 0.2 mg/L of the analyte.

Analysis for the phenols were conducted by Envirotech Research, Inc. in Edison, New Jersey, and the remaining analyses were conducted by ENVIROGEN's Analytical Laboratory. Both Laboratories are certified in the State of New Jersey.

4.0 SETUP AND CONDUCT OF THE MICROCOSM TESTING

The test microcosms were set up in 250 ml Erlenmeyer flasks with Teflon-lined stoppers to form a non-sorbing seal. Each microcosm received 120 gram (wet wt.) of site soil and 75 ml of site groundwater to provide a fluid soil slurry. The headspace was maintained aerobic by periodically flushing with oxygen gas. A total of 18 microcosms were used in the testing, with triplicates set up for each of the following conditions:

A. killed control,
B. no amendments,
C. inorganic nutrient amendment (i.e., nitrogen and phosphorus),

D. benzoate amendment,

E. benzoate and inorganic nutrient amendment,

F. positive control using engineered bacteria (GEM).

The setup of the 6 sets of triplicate microcosms is summarized in Table 1.0 and in the following text.

Table 1.0. Setup of Test Microcosms

Test Conditions[1] (ID)	$HgCl_2$ (mg)	PO_4 [2] (ml)	Benzoate[3] (ml)	Bacteria I Inoculum[4] (ml)	Distilled H_2O[5] (ml)
Killed Control (A)	200				14
Non-Amended (B)	—	—	—	—	14
Phosphate Amended (C)	—	7.5	—	—	7.5
Benzoate Amended (D)	—	—	0.123	—	14
Benzoate & Phosphate (E)	—	7.5	0.123	—	7.5
GEM & Phosphate (F)	—	7.5	—	7.5	—

1 Each flask received 120 g (wet weight) of homogenized soil and 75 ml of site water.

2 Phosphate was supplied from a concentrated stock containing $K_2HPO_4 \cdot 3H_2O$ and $NaH_2PO_4 \cdot H_2O$ at 85 and 20 g/L, respectively.

3 0.123 ml of a 1.0 M solution of Na Benzoate.

4 For Test Condition F, a genetically-engineered bacterial strain, constructed specifically for biotreatment of chloro- and methylphenol mixtures was grown in a basal salts medium on 4-methylbenzoate and 3-chlorobenzoate (5 mM for each) and subsequently concentrated for inoculation into the test microcosms. Approximately 3×10^8 cells were inoculated into each of the three triplicate test microcosms.

5 Distilled water was added as needed to maintain equivalent slurry solids concentrations among all test microcosms.

The soil was homogenized as described previously. Because the soil had a clayey consistency, sieving was not conducted, but large debris (i.e., woody material) was removed by hand immediately before dispensing soil to the microcosms. One hundred twenty (120) grams (wet weight) of homogenized soil and 75 ml of groundwater was delivered into each 250 ml microcosm.

A total of 18 test microcosms were prepared as follows:

- Three killed control microcosms, (Test Condition A, microcosms #1, #2, and #3) were prepared using soil and groundwater samples spiked with mercuric chloride to yield a final inhibitor concentration of 1000 ppm (mg/L). The pH of the slurry mixture was also adjusted to approximately 4.0 (using concentrated HCl) to minimize bacterial activity. These controls were used to verify that significant volatile losses or stripping of the COCs did not occur.

- Test Condition B (microcosms #4, #5, and #6). The microcosm headspace was exchanged with oxygen to provide aeration for biodegradation of the COCs. These microcosms were used to examine biodegradation of COCs under controlled pH conditions without inorganic nutrient amendments.

- Test Condition C (microcosms #7, #8, and #9). The flasks were prepared in the same manner as in Test Condition B above, however, water soluble nutrients (phosphate and ammonia) were added for this test procedure. These microcosms were used to examine aerobic biodegradation of COCs under pH controlled and nutrient amended conditions.

- Test Condition D (microcosms #10, #11, and #12). These flasks were prepared as for Test Condition B, however, a carbon source (benzoate) was added to the microcosms. This test was to determine if carbon addition alone (with no inorganic nutrient amendment) would stimulate microbial activity for more effective biodegradation of the COCs. Benzoate levels at the completion of the study were also determined.

- Test Condition E (microcosms #13, #14, and #15). These microcosms were prepared as in Test Condition C above, however, the carbon source benzoate was also added as in Test Condition D. This test was to determine if biodegradation of the COCs is more effective with the addition of both inorganic and carbon nutrient amendments. Benzoate levels at the completion of the study was also determined.

- Test Condition F (microcosms #16, #17, and #18). These microcosms were prepared as in Test Condition C above, however, as a positive control a specialty strain of bacteria (supplied by Dr. Ken Timmis of the Institute of Biotechnology in Germany) designed specifically to biotreat mixtures of chloro- and methylphenols was added to the soil slurry.

To maintain aerobic conditions, the headspace of all flasks (including the killed controls) was flushed periodically with oxygen. Oxygen was used because it minimized the volume of gas needed for aeration and therefore minimized the volatilization of the volatile (benzene) component. Appropriate levels of oxygen in the headspace were verified indirectly (as described below) by measuring dissolved oxygen (DO) in the slurry supernatant. Since the headspace of all flasks, including the killed controls, were exchanged with oxygen gas, benzene present in the headspace was expected to be displaced from the flask. To estimate the extent of benzene removal via this route, the displaced headspace gas from one of the killed controls (Flask #1) was passed through an ORBO air sampling tube (ORBO-100), using a new tube for each exchange. At the completion of the study, the contents of all ORBO tubes were combined and analyzed to quantify the total amount of benzene flushed from the headspace.

Given the relatively high concentrations of the COCs it was feasible that biodegradation could result in matrix changes that could impact the pH, dissolved oxygen, and inorganic nutrient levels. Thus, weekly monitoring of these parameters was performed. The flasks were removed from the rotary shaker and allowed to sit without shaking for a period of up to 30 minutes, to allow for solids settling. Subsamples (approximately 10 ml) of the aqueous supernatant were then retrieved and analyzed for nutrients, dissolved oxygen, and pH. This aqueous sample was retrieved without opening the microcosm. To prevent oxygenation of the retrieved sample (which would yield inaccurate DO measurements) the sampling port and sampling syringe were flushed with nitrogen prior to retrieving the aqueous subsample. The retrieved sample was immediately transferred to a nitrogen-flushed vial, where DO readings were obtained. The microcosm headspace was replenished with oxygen gas when the aqueous DO dropped below 3.0 mg/L. The nutrient levels in the microcosms were determined using HACH test kits as described previously, and the pH was determined by using a standard pH probe.

The flask microcosms were incubated throughout the study at 12°C to 17°C which is representative of ambient *in situ* temperatures. Solids were maintained suspended by mixing the flask microcosms on a rotary shaker at 150 rpm. The killed controls (condition A) and the treatment conditions B-E were incubated for 5 weeks, and the treatment F microcosms (GEM) were incubated for 4 weeks.

At the completion of the incubation the microcosm supernatants were analyzed a final time to verify that appropriate levels of DO and inorganic nutrients were maintained.

To collect slurry samples, for final analysis, the solids in each flask were suspended by shaking and a wide-mouth pipette was used to collect the appropriate volume of slurry. Approximately 40 ml of the treated slurry solids were transferred to an 8 oz. jar for phenols analysis (and benzoate analysis where appropriate), 20 ml of the slurry was transferred to a VOA vial for benzene analysis, and 25 ml of the slurry was removed for TOC determination and bacterial counts. These samples were held at 4°C away from light until analyzed as described in Section 3.0 for phenols, benzene, and TOC levels.

5.0 SUMMARY OF RESULTS

Five of the 6 microcosm sets were incubated for 5 weeks at 12°C to 17°C. The construction of microcosms dosed with the genetically-engineered bacterium (Test Condition F) was delayed by one week (due to delivery of the bacteria from Germany), thus these microcosms were incubated for only 4 weeks before analyses. Periodic monitoring of liquid supernatant samples from selected microcosms at weeks 1 through 5 showed that the pH, dissolved oxygen, and phosphate levels were within targeted ranges without the need for pH or nutrient amendments.

Phosphate levels in the nutrient-amended microcosms (Test Conditions C & E) and the GEM-amended microcosms (Test Condition F) were at approximately 5 mg/L throughout the study, and phosphate levels were at or below detection (i.e., < 0.4 mg/L) in the remaining non-nutrient amended microcosms. The pH was near neutrality in all biologically-active microcosms, and was initially adjusted to pH 4.0 in the killed controls with the use of HCl. During the first two weeks of incubation the pH in the killed controls slowly increased to pH 5.0 and above, but additional HCl was used to bring the pH back to below 4.0 by week 3. To ensure that the microcosms remained aerobic, the headspace (including that in the killed control) was flushed with pure oxygen. Dissolved oxygen (DO) levels in the slurry aqueous phase was maintained in excess of 5.5 mg/L. Benzoate was added to two of the microcosms (Conditions D and E) at 0.001 M, but was undetectable by the completion of the study. A summary of all Operational Monitoring data are provided in Appendix B.

Significant biodegradation of the targeted methyl- and chlorophenols was observed after 5 weeks of incubation (Table 2.0). The six (6) phenol analytes monitored during the biotreatability study (2-methylphenol, 4-methylphenol, 2,4-dimethylphenol, 2,4-dichlorophenol, 4-chloro-3-methylphenol, and 2,4,6-trichlorophenol) were measured in the killed control at 11, 670 μg/Kg at the 5-week timepoint, whereas the 5 biologically-active microcosm sets showed total phenol concentrations between 2310 μg/Kg and 4570 μg/Kg (which translates to 61% to 80% phenol degradation). The highest levels of biodegradation were observed for the phosphate-amended microcosms (80% total phenol biodegradation) and the non-amended microcosms (76% total phenol degradation). No other nutritional amendments, nor the addition of the GEM, increased the extent of phenol degradation beyond the level attainable by the use of aeration alone, or by the use of aeration and phosphate additions.

For comparison, Table 2.0 also summarizes the phenol concentrations observed in a) the initial soil only, and b) the initial soil after it was amended with site water that also contained phenols. The phenol levels in the initial soil and the initial soil/water mixture deviate somewhat from the values observed in the killed control, and this may be due to non-homogeneous initial soil samples. The initial soil was in fact mixed to achieve homogeneity, but the duration of mixing was kept to a minimum to prevent excessive volatilization of benzene. The phenol values from the killed controls are considered to be more homogeneous due to the extensive mixing they were subject to during the 5 week incubation, and were therefore considered to be more representative of the starting phenol concentrations. Thus, the phenol concentrations measured in the killed control were used to calculate the extent of phenol degradation in the test microcosms.

Table 2.0. Biodegradation of Methyl- and Chlorophenols in Aerobic Microcosms (a).

Analyte	Initial Sample (c) Soil only	Initial Sample (c) w/ water	Analysis After 5 weeks of Aerobic Incubation (µg/Kg) Killed Control (Cond. A)	Non-Amended (Cond. B)	Phosphate Amended (Cond. C)	Benzoate Amended (Cond. D)	Benzoate & Phosphate (Cond. E)	GEM & Phosphate (Cond. F)
2-methylphenol	1070 (325)	1450 —	680* (277)	185* (98)	110* (17)	243* (144)	280* (82)	440* (306)
4-methylphenol	6050 (636)	13,000 —	8233 (4996)	1733 (416)	1367 (152)	2233 (493)	2500 (964)	2867 (1172)
2,4-dimethylphenol	1030* (381)	1620 —	447* (167)	142* (155)	69* (70)	91* (43)	60* (17)	133* (111)
2,4-dichlorophenol	140* (28)	140 —	387* (402)	173* (59)	180* (20)	197* (15)	233* (85)	210* (46)
4-chloro-3-methylphenol	610 (99)	1010 —	1540* (1442)	347* (146)	337* (142)	487* (85)	763* (263)	637* (234)
2,4,6-trichlorophenol	160* (44)	300 —	383* (294)	223* (91)	250* (10)	257* (31)	323* (76)	283* (51)
Total Phenols	9050	17,520	11,670	2803	2313	3508	4159	4570
Percent Degradation (d) (Total Phenols)	—	—	—	76	80	70	64	61
Percent Degradation (d) (4-Methylphenol Only)	—	—	—	79	83	73	70	65

(a) Microcosms were incubated at 12°C to 17°C for 5 weeks, except the microcosms amended with the Genetically Engineered Microorganisms (GEM) which were incubated for 4 weeks.

(b) The values indicate µg/Kg of the analyte on a dry weight basis, and the numbers in brackets show the standard deviation from triplicate analyses. The asterisks indicate the values that were either wholly or partially derived using "J" values. The raw data are provided in Appendix B.

(c) The initial phenol concentration (µg/Kg) is reported for the soil, and for the combined soil and water components after adding contaminated site water. The phenol concentration that includes the site water was calculated by adding the contaminant concentrations from separate analyses of the soil and water components. The raw data are provided in Appendix B.

(d) The percent degradation for the total phenols and the 4-methylphenol was calculated by using the analytical results from the killed microcosms as "initial" contaminant levels.

Table 3.0. Other Organic Analyses and Parameters Measured During the Biotreatability Study.

Analysis (units)	Initial Soil	Killed Control (Cond. A)	Non-Amended (Cond. B)	Phosphate Amended (Cond. C)	Benzoate Amended (Cond. D)	Benzoate & Phosphate (Cond. E)	GEM & Phosphate (Cond. F)
		Analysis After 5 weeks of Aerobic Incubation					
Total Organic Carbon (mg/L)	—	2033	2167	2200	2300	2033	2033
pH	7.9	3.8	7.0	7.0	7.0	6.9	6.7
Benzene (µg/Kg)	46	65	75	35	44	71	13
Benzoate (mg/Kg)	—	—	—	—	<27	<27	—
Total Heterotrophs (cfu/mL x 10^3)*	<1	< 1	1,433	20,067	1,390	5,767	35,000
Phenol Degraders (cfu/mL x 10^3)*	<1	<1	1,113	2,933	830	5,733	49,333

*cfu = colony forming units

Several of the phenolic constituents were below the quantification limit of the analytical method, and these data are identified in Table 2.0 with an asterisk(*). Nevertheless, the reduction in phenols shows a pattern consistent with biological degradation, with the readily biodegradable phenols (e.g., 2-methylphenol and 2,4-dimethylphenol) showing extensive depletion, and the more recalcitrant phenols (e.g., 2,4,6-trichlorophenol) showing little to no depletion after 5 weeks of incubation. The extent of biodegradation was calculated separately for the 4-methylphenol, the phenol constituent with all data within quantifiable limits, to show that the extent of 4-methyl phenol degradation parallels that observed for the total phenols (Table 2.0).

The fate of the benzene contaminant was also monitored during the biotreatability study. Benzene was measured at 46 ppb in the initial soil and at 65 ppb in the killed control after 5 weeks of incubation (Table 3.0). Benzene levels were reduced significantly in the GEM-amended microcosm to a residual level of 13 ppb. In contrast, the benzene levels were still high in the range of 35 to 75 ppb by the completion of the study in all of the other biologically active microcosms. Thus, the benzene component is biodegradable but its biodegradation potential may be dependent on the metabolic status of the cells present (i.e., whether the cells are appropriately induced). It is likely that given sufficient time the benzene component would biodegrade, but the onset of benzene biodegradation may be delayed until the level of phenols is reduced significantly.

To estimate the benzene loss caused by the periodic headspace flushing, carbon traps (ORBO 100) were used on the exit port of one control microcosm. Analysis of these traps showed that some benzene was lost to headspace flushing; however, the amount of benzene stripped could not be accurately quantified as it was below the detection limit of the analytical method.

Analysis of total organic carbon (TOC) was performed as a alternative means of quantifying phenol degradation. Specifically, the TOC measurement was used to determine if the biotreatment would result in the formation of water-soluble phenolic polymers that could potentially result from the oxidative metabolism of phenols. The TOC levels among all microcosms (killed control and the biologically-active) were at comparable levels that ranged from 2033 to 2300 mg/l (Table 3.0). There was no apparent correlation between the extent of phenol degradation and the increased TOC levels. For example, the highest TOC value was observed in the benzoate-amended microcosm, which showed only marginal phenol degradation. Based on the TOC analyses, the phenols were depleted due to their biodegradation and not their transformation into water soluble polymers.

The microbial soil population was initially very low, with total cell-counts below the detection limit of 1×10^3 colony forming units (cfu) per gram-soil (Table 3.0). By the end of the incubation all live microcosms showed a significant increase in both the total heterotrophs and phenol degraders, which suggests that the initial low cell counts may have been due to general unfavorable growth conditions, but not specifically due to phenol toxicity. In general, (excepting the GEM-amended microcosms) the microbial population increased with the addition of phosphate and carbon. There was no correlation with the cell concentration and the extent of phenol degradation achieved in the microcosms. As an example, the non-amended microcosms (Condition B) showed extensive phenol degradation, but these microcosms had one of the lowest cell populations of all the treatments. The phosphate amendment (Condition C) also stimulated cell growth, but with no significant increase in phenol degradation. Thus, these data suggest that addition of phosphate can significantly increase cell mass, but phosphate provides only limited benefit for increasing the degradation of phenols. Because of the clayey nature of the Site soils, it is recommended that phosphate be kept to a minimum to prevent over growth of cells. Excessive cell growth could potentially block the soil micropores, which in turn would diminish the ability to introduce oxygen into the subsurface.

It is concluded that the chloro- and methylphenols at the Nitro, West Virginia site are amenable to biodegradation, and that the cooler ambient temperatures and the phenol-contaminated site water will not adversely limit the extent of biodegradation that is possible. Aeration and mixing of the site soils was, by itself, sufficient to increase the total heterotrophs and phenol degraders by over 1000 fold. The laboratory biodegradability study has also shown that aeration of the site soils may be sufficient to attain 80% biodegradation of the 4-methylphenol component, and the study has shown that additional amendments of phosphate are unecessary.

It should be noted that the biodegradation rates observed under laboratory conditions will be higher than the biodegradation rates achievable under field conditions. The slurried systems used in laboratory studies allow for a rapid assessment of biodegradation feasibility, but tend to overestimate the rate of degradation when compared to field conditions. Nevertheless, given sufficient time, the extent of phenols biodegradation attainable under field conditions should be generally comparable to the extent of biodegradation attained in the laboratory study.

6.0 REFERENCES

Rojo, F., Piper, D. II., Engesser, K. H., Knackmuss, H. J. and Timmis, K. N., 1987. Assemblage of ortho cleavage route for simultaneous degradation of chloro- and methylaromatics, Science 238:1395-1398.

APPENDIX A

MICROBIOLOGICAL PROFILE

A. Introduction:

This purpose of this method is for the enumeration of bacteria present in soil, sludge, wastewater and groundwater. There are basically two types of microbial populations of interest to ENVIROGEN. The most obvious population are the total viable bacterial present in soil, sludge, etc. This bacterial population may also be characterized by the number of bacteria that are capable of utilizing specific compounds as their sole carbon and energy source. This information is useful to indicate the number of bacteria found indigenously in soil, water, etc. that can degrade the target compounds.

Total viable bacterial counts can be determined in a number of ways, dependent upon the type of sample matrix (e.g. soil, water). The following procedure describes the process for determining the total viable bacterial found in soil and sludge samples. A sample is systematically diluted in sterile liquid medium to obtain a dilution range when plated onto plate count media results in a range capable of being enumerated (30-300 colonies). Since it is not known initially what the bacterial counts will be, a range of dilutions are performed to achieve this 30-300 bacterial colonies per petri plate.

B. Materials and Reagents:

1. Sterile 1X BSM solution
2. Sterile test tubes (18 x 150 mm) containing 9 ml sterile saline solution
3. Petri plates containing R2A agar
4. Petri plates containing BSM agar with target contaminant(s)
5. 50 ml orange cap conical tubes
6. Vortex mixer
7. Incubator (30°C)

C. Procedure

1. Transfer 1 g (ml) of sample into 50 ml conical tubes. Pipette 9 ml of the sterile BSM solution into the conical tube and vortex thoroughly to achieve adequate mixing. This transfer will serve as the first in a series of dilutions to bring the bacteria to countable range when plated. The effective dilution of the sample is 10^{-1} (1/10).

2. Serially dilute the sample above transferring 1 ml of the sample into the test tubes containing 9 ml of sterile BSM solution. Vortex the contents of each tube thoroughly before transferring into subsequent tubes. As a rule of thumb, for soils whose bacterial population is unknown, there should be a total of seven dilution tubes per sample including the one created in step 1 above. Each subsequent dilution of the sample creates a dilution of 1/10.

3. Pipette 0.1 ml of the contents of tubes 3-7 onto petri plates containing R2A agar or contaminant specific BSM agar. Spread the liquid evenly on the plates using a glass rod and spreading table. One duplicate is performed with each sample set.

   a. R2A agar: BBL R2A agar.
   18.1 g/l liter sterile Deionized water.

   b. Contaminant specific BSM agar:
   15.0 g BBL granulated agar into 1 liter sterile 1X BSM.

   The organic compound of interest is supplied to the bacteria in a number of ways depending upon the compound. If the compound is water-soluble to the levels desired in the media (~5mM), it is mixed into the agar before the plates are poured. If the compound is volatile and cannot be combined into the agar itself, it can be supplied by vapor addition. A common vapor addition method is to incubate the plates under a beaker which also contains a serum vial containing the volatile compound. For solids that readily sublime (e.g., biphenyl), crystals of the compound are added to the cover of the inverted plate.

4. Place plates in the incubator and incubate until visible colonies form. Usually 24-48 hours for R2A plates. Five days for contaminant specific plates.

D. **Calculations**

1. Observe the bacterial growth on the petri plates and chose the dilution which gives between 30-300 colonies per plate. Count that dilution and record the number of colonies. Multiply this value by the inverse of the dilution factor. For example, if on the selected plate you have a dilution factor of 10^{-6}, you count 123, you would get a value of 1.23×10^{8}. This would be a reported value of 1.2×10^{8} cfu/g. For the duplicate sample, take the average of the two values.

APPENDIX B

Operational Monitoring Summary

Flask No.	Week 1			Week 2			Week 3			Week 4			Week 5		
	PO4 (mg/L)	DO (mg/L)	pH	PO4 (mg/L)	DO* (mg/L)	pH	PO4 (mg/L)	DO (mg/L)	pH	PO4 (mg/L)	DO (mg/L)	pH	PO4 (mg/L)	DO (mg/L)	pH
1	nd	nd	5.5	nd	nd	5.2	0.5	8.0	3.2	nd	nd	nd	0.57	9.6	3.8
2	nd	nd	5.6	nd	nd	5.2	0.5	7.5	3.4	nd	nd	nd	nd	nd	nd
3	nd	nd	5.4	nd	nd	4.0	nd	8.4	3.5	nd	nd	nd	nd	nd	nd
4	nd	6.4	7.0	nd	15.0	6.9	nd	8.1	6.8	0.4	5.6	7.1	<0.4	9.2	7.0
5	nd	nd	nd	nd	12.8	7.0	0.5	8.1	6.9	nd	nd	nd	nd	nd	nd
6	nd	7.4	7.2	nd	18.9	6.8	0.5	6.6	6.9	nd	nd	nd	nd	nd	nd
7	>5	7.0	6.8	>5	16.8	6.8	nd	6.8	6.9	4.8	6.8	7.3	3.6	10	7.0
8	>5	5.5	6.7	>5	7.9	6.9	>5	8.1	6.9	nd	nd	nd	nd	nd	nd
9	>5	8.2	6.6	>5	11.1	7.0	>5	8.9	6.9	nd	nd	nd	nd	nd	nd
10	nd	nd	7.2	nd	10.8	7.6	nd	8.8	7.2	1.4	8.8	7.1	0.7	8.8	7.0
11	nd	7.5	7.3	nd	12.9	7.5	1.3	8.3	6.6	nd	nd	nd	nd	nd	nd
12	nd	6.9	7.3	nd	15.1	7.2	1.3	8.7	6.9	nd	nd	nd	nd	nd	nd
13	>5	8.2	6.8	>5	17.6	7.0	nd	8.3	6.9	4.5	6	6.8	>5	9.2	6.9
14	>5	7.5	6.8	>5	16.8	7.1	4.5	8.8	6.9	nd	nd	nd	nd	nd	nd
15	>5	8.1	6.8	>5	12.4	7.1	4.5	9.2	6.9	nd	nd	nd	nd	nd	nd
16	nd	nd	nd	>5	7.7	nd	>5	8.2	6.7	>5	9.2	6.9	>5	9.2	6.7
17	nd	nd	nd	>5	7.8	6.8	>5	8.7	6.5	nd	nd	nd	nd	nd	nd
18	nd	nd	nd	>5	8.0	7.1	nd	8.4	6.7	nd	nd	nd	nd	nd	nd

*The headspace gas was periodically flushed with pure oxygen gas to account for the high dissolved oxygen in the aqueous phase.
nd= not determined

Condition	Analyte	Replicates (ppb)			Replicate Statistics (ppb) Mean	StdDev	Confidence Intervals (%) 80	90	95
Initial	2 methylphenol, initial	470	1300	840	1070.0	325.3	707.9	1452.2	2922.4
	4-methylphenol, initial	4700	6500	5600	6050.0	636.4	1385.1	2841.3	5717.7
	2,4-dimethylphenol, initial	**230**	1300	760	1030.0	381.8	831.1	1704.8	3430.6
	2,4-dichlorophenol, initial	**110**	**160**	**120**	140.0	28.3	61.6	126.3	254.1
	4-chloro-3-methylphenol, initial	650	540	680	610.0	99.0	215.5	442.0	889.4
	2,4,6-trichlorophenol, initial	**210**	**130**	**140**	160.0	43.6	47.5	73.5	108.3
killed (at 5 weeks)	2 methylphenol	**520**	1000	**520**	680.0	277.1	301.8	467.2	688.5
	4-methylphenol	5200	14000	5500	8233.3	4996.3	5440.4	8423.1	12412.6
	2,4-dimethylphenol	**350**	**350**	640	446.7	167.4	182.3	282.3	416.0
	2,4-dichlorophenol	**180**	850	**130**	386.7	402.0	437.8	677.8	998.8
	4-chloro-3-methylphenol	820	3200	**600**	1540.0	1441.8	1570.0	2430.7	3581.9
	2,4,6-trichlorophenol	**250**	**720**	**180**	383.3	293.7	319.8	495.1	729.5
non-amended (at 5 weeks)	2 methylphenol	**280**	**190**	**84**	184.7	98.1	106.8	165.4	243.7
	4-methylphenol	2200	1600	1400	1733.3	416.3	453.3	701.9	1034.3
	2,4-dimethylphenol	**36**	**320**	**71**	142.3	154.9	168.6	261.1	384.7
	2,4-dichlorophenol	**240**	**130**	**150**	173.3	58.6	63.8	98.8	145.6
	4-chloro-3-methylphenol	**510**	**230**	**300**	346.7	145.7	158.7	245.7	362.0
	2,4,6-trichlorophenol	**290**	**120**	**260**	223.3	90.7	98.8	153.0	225.4
PO4 only (at 5 weeks)	2 methylphenol	**130**	**100**	**100**	110.0	17.3	18.9	29.2	43.0
	4-methylphenol	1200	1500	1400	1366.7	152.8	166.3	257.5	379.5
	2,4-dimethylphenol	**150**	**34**	**24**	69.3	70.0	76.3	118.1	174.0
	2,4-dichlorophenol	**160**	**200**	**180**	180.0	20.0	21.8	33.7	49.7
	4-chloro-3-methylphenol	**260**	**250**	**500**	336.7	141.5	154.1	238.6	351.6
	2,4,6-trichlorophenol	**240**	**260**	**250**	250.0	10.0	10.9	16.9	24.8
Benzoate only (at 5 weeks)	2 methylphenol	**410**	**160**	**160**	243.3	144.3	157.2	243.3	358.6
	4-methylphenol	2800	2000	1900	2233.3	493.3	537.1	831.6	1225.5
	2,4-dimethylphenol	**140**	**62**	**71**	91.0	42.7	46.5	71.9	106.0
	2,4-dichlorophenol	**210**	**200**	**180**	196.7	15.3	16.6	25.8	37.9
	4-chloro-3-methylphenol	**520**	**550**	**390**	486.7	85.0	92.6	143.4	211.3
	2,4,6-trichlorophenol	**230**	**290**	**250**	256.7	30.6	33.3	51.5	75.9
Benz & PO4 (at 5 weeks)	2 methylphenol	**300**	**190**	**350**	280.0	81.9	89.1	138.0	203.4
	4-methylphenol	2100	1800	3600	2500.0	964.4	1050.1	1625.8	2395.8
	2,4-dimethylphenol	**66**	**74**	**41**	60.3	17.2	18.7	29.0	42.8
	2,4-dichlorophenol	**200**	**170**	**330**	233.3	85.0	92.6	143.4	211.3
	4-chloro-3-methylphenol	930	**460**	900	763.3	263.1	286.5	443.6	653.7
	2,4,6-trichlorophenol	**390**	**240**	**340**	323.3	76.4	83.2	128.8	189.7
PO4 + GEM (at 4 weeks)	2 methylphenol	790	**220**	**310**	440.0	306.4	333.7	516.6	761.3
	4-methylphenol	4200	2400	2000	2866.7	1171.9	1276.1	1975.7	2911.4
	2,4-dimethylphenol	**260**	**80**	**58**	132.7	110.8	120.7	186.8	275.3
	2,4-dichlorophenol	**260**	**200**	**170**	210.0	45.8	49.9	77.3	113.8
	4-chloro-3-methylphenol	890	**590**	**430**	636.7	233.5	254.3	393.7	580.2
	2,4,6-trichlorophenol	**340**	**270**	**240**	283.3	51.3	55.9	86.5	127.5

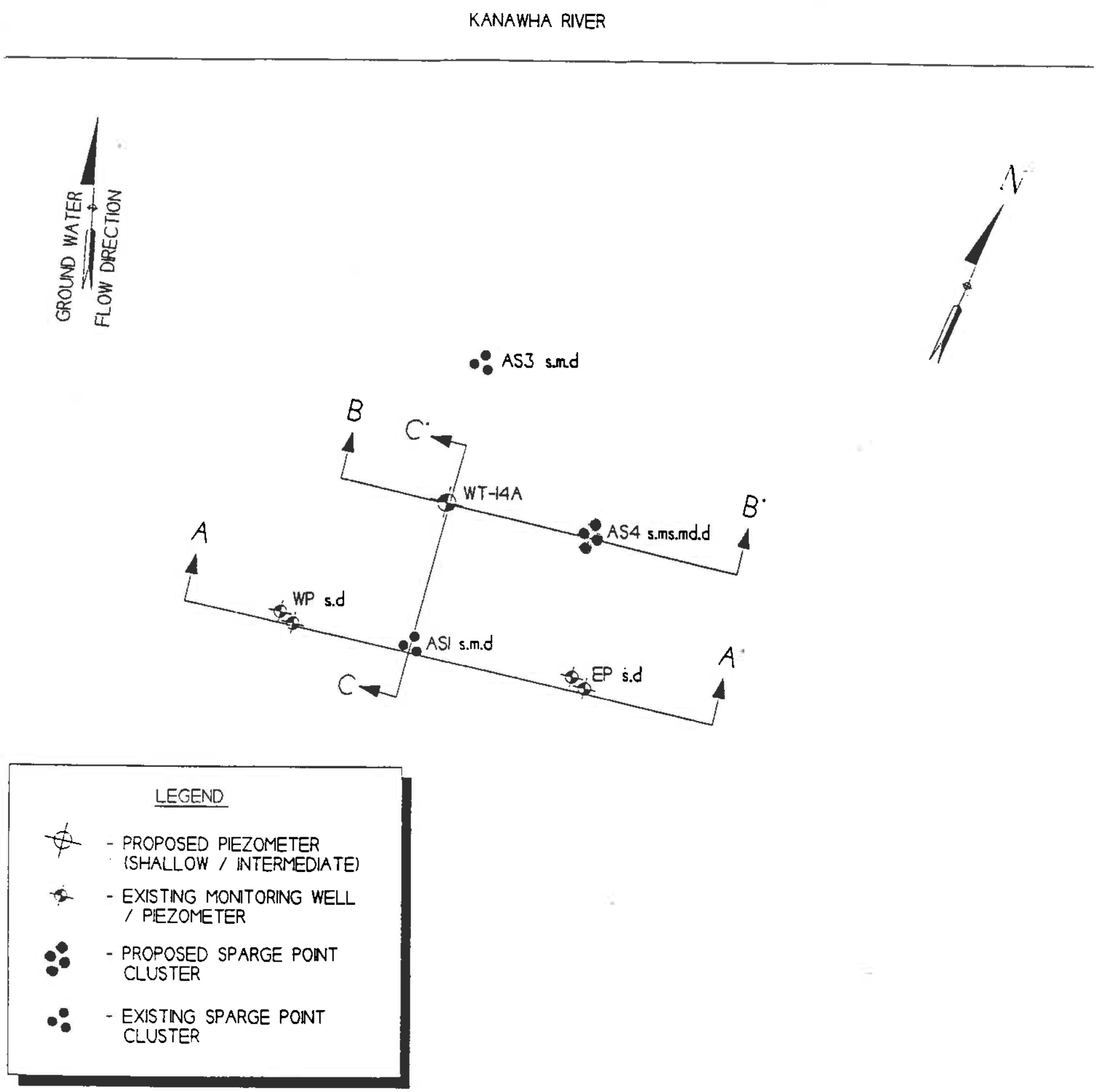
he data highlighted in bold typeface are "J" values that were below the Minimum Detection Limit for Method 8270.

						Replicate Statistics				
								Confidence Intervals (%)		
Condition	Analyte	Unit	Replicates			Mean	StdDev	80	90	95
Initial soil	TOC	mg/L	—	—	—	—	—	—	—	—
	Benzene	µg/Kg	35	49	42	45.500	4.950	10.8	22.1	44.5
	heterotrophs	cfu/ml (x 10^3)	<1	<1	<1	—	—	—	—	—
	phenol degraders	cfu/ml (x 10^3)	<1	<1	<1	—	—	—	—	—
	benzoate	mg/Kg				—	—	—	—	—
	pH	—	7.9			—	—	—	—	—
Initial water	TOC	mg/L	87			—	—	—	—	—
	Benzene	µg/L	1400			—	—	—	—	—
	heterotrophs	cfu/ml (x 10^3)	—			—	—	—	—	—
	phenol degraders	cfu/ml (x 10^3)	—			—	—	—	—	—
	benzoate	mg/Kg	—			—	—	—	—	—
	pH	—	7.5							
	2 methylphenol	µg/L	490			—	—	—	—	—
	4-methylphenol	µg/L	8900			—	—	—	—	—
	2,4-dimethylphenol	µg/L	760			—	—	—	—	—
	2,4-dichlorophenol	µg/L	<150			—	—	—	—	—
	4-chloro-3-methylphenol	µg/L	500			—	—	—	—	—
	2,4,6-trichlorophenol	µg/L	180			—	—	—	—	—
killed	TOC	mg/L	2000	2200	1900	2033.3	152.8	166.3	257.5	379.5
(at 5 weeks)	Benzene	µg/Kg	42	78	76	65.33	20.2	22.0	34.1	50.3
	heterotrophs	cfu/ml (x 10^3)	<1000	<1000	<1000	—	—	—	—	—
	phenol degraders	cfu/ml (x 10^3)	<1000	<1000	<1000	—	—	—	—	—
	benzoate	mg/Kg				—	—	—	—	—
	ORBO (volatilized benzene)	Total µg stripped	**2200**			—	—	—	—	—
non-amended	TOC	mg/L	2200	2300	2000	2166.7	152.8	166.3	257.5	379.5
(at 5 weeks)	Benzene	µg/Kg	75	66	84	75.00	9.0	9.8	15.2	22.4
	heterotrophs	cfu/ml (x 10^3)	1,800	1,200	1,300	1433.3	321.5	350.0	541.9	798.6
	phenol degraders	cfu/ml (x 10^3)	940	1,200	1,200	1113.3	150.1	163.5	253.1	372.9
	benzoate	mg/Kg	—			—	—	—	—	—
PO4 only	TOC	mg/L	2100	2200	2300	2200.0	100.0	108.9	168.6	248.4
(at 5 weeks)	Benzene	µg/Kg	30	**18**	59	35.67	21.1	23.0	35.5	52.4
	heterotrophs	cfu/ml (x 10^3)	5,400	5,800	49,000	20066.7	25057.8	27285.0	42244.0	62252.0
	phenol degraders	cfu/ml (x 10^3)	1,300	3,300	4,200	2933.3	1484.4	1616.3	2502.4	3687.7
	benzoate	mg/Kg	—			—	—	—	—	—
Benzoate only	TOC	mg/L	2300	2100	2500	2300.0	200.0	217.8	337.2	496.9
(at 5 weeks)	Benzene	µg/Kg	56	45	31	44.00	12.5	13.6	21.1	31.1
	heterotrophs	cfu/ml (x 10^3)	870	1,900	1,400	1390.0	515.1	560.9	868.3	1279.6
	phenol degraders	cfu/ml (x 10^3)	640	650	1,200	830.0	320.5	349.0	540.3	796.2
	benzoate	mg/Kg	<27	<27	<27	—	—	—	—	—
Benz & PO4	TOC	mg/L	1800	2300	2000	2033.3	251.7	274.0	424.3	625.2
(at 5 weeks)	Benzene	µg/Kg	130	40	42	70.67	51.4	56.0	86.6	127.7
	heterotrophs	cfu/ml (x 10^3)	3,300	8,400	5,600	5766.7	2554.1	2781.1	4305.8	6345.2
	phenol degraders	cfu/ml (x 10^3)	4,300	6,200	6,700	5733.3	1266.2	1378.8	2134.7	3145.7
	benzoate	mg/Kg	<27	<27	<27	—	—	—	—	—
PO4 + GEM	TOC	mg/L	2100	1800	2200	2033.3	208.2	226.7	350.9	517.2
(at 4 weeks)	Benzene	µg/Kg	<42	**11**	**14**	12.5	—	—	—	—
	heterotrophs	cfu/ml (x 10^3)	12,000	57,000	36,000	35000.0	22516.7	24518.0	37960.0	55939.0
	phenol degraders	cfu/ml (x 10^3)	36,000	67,000	45,000	49333.3	15947.8	17365.3	26885.9	39619.8
	benzoate	mg/Kg	—	—	—	—	—	—	—	—

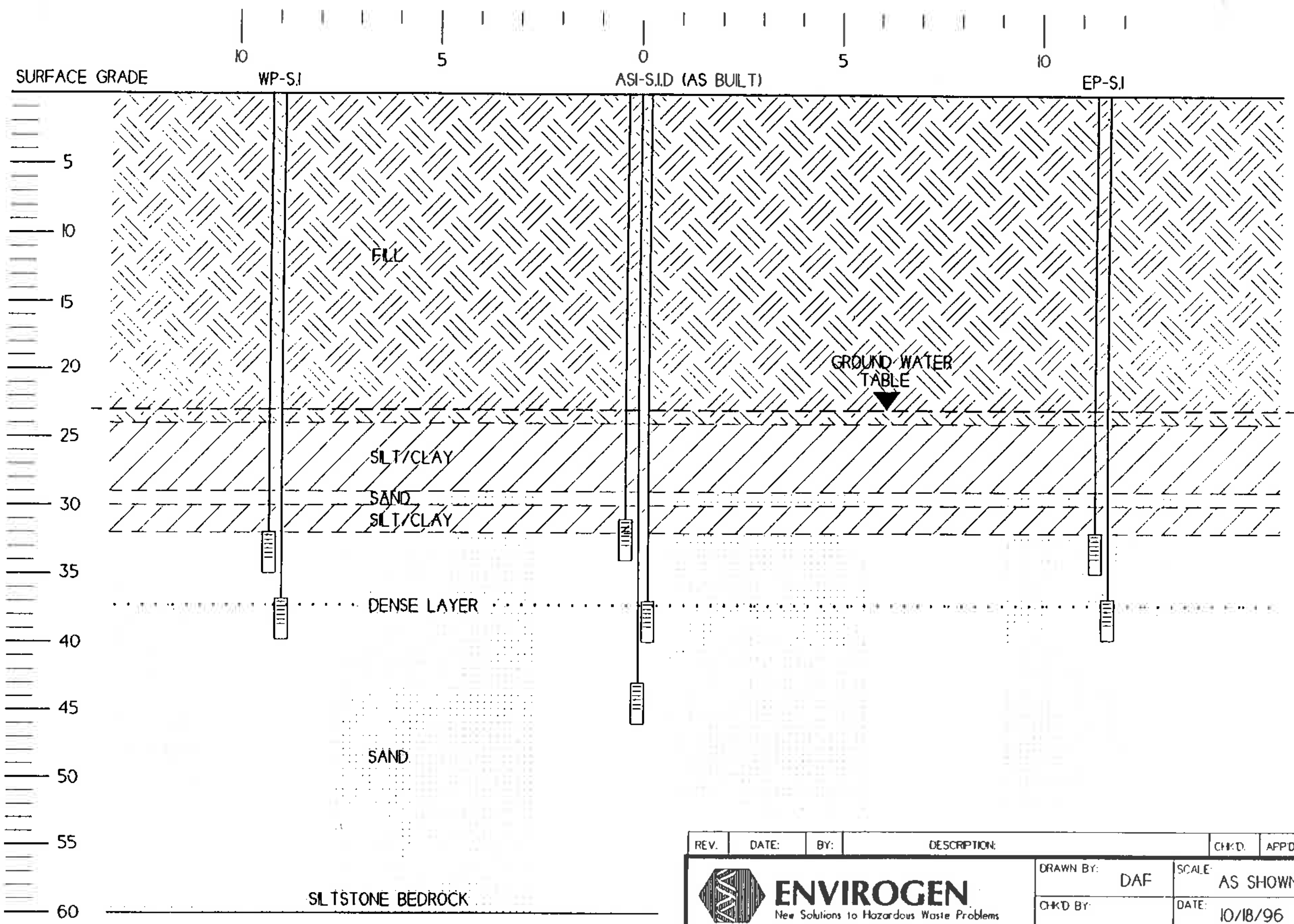
The data highlighted in bold typeface are "J" values that were below the Minimum Detection Limit for the method.

APPENDIX L

City of Nitro Dump Area
Oxygen Injection System
Construction Details/Sections

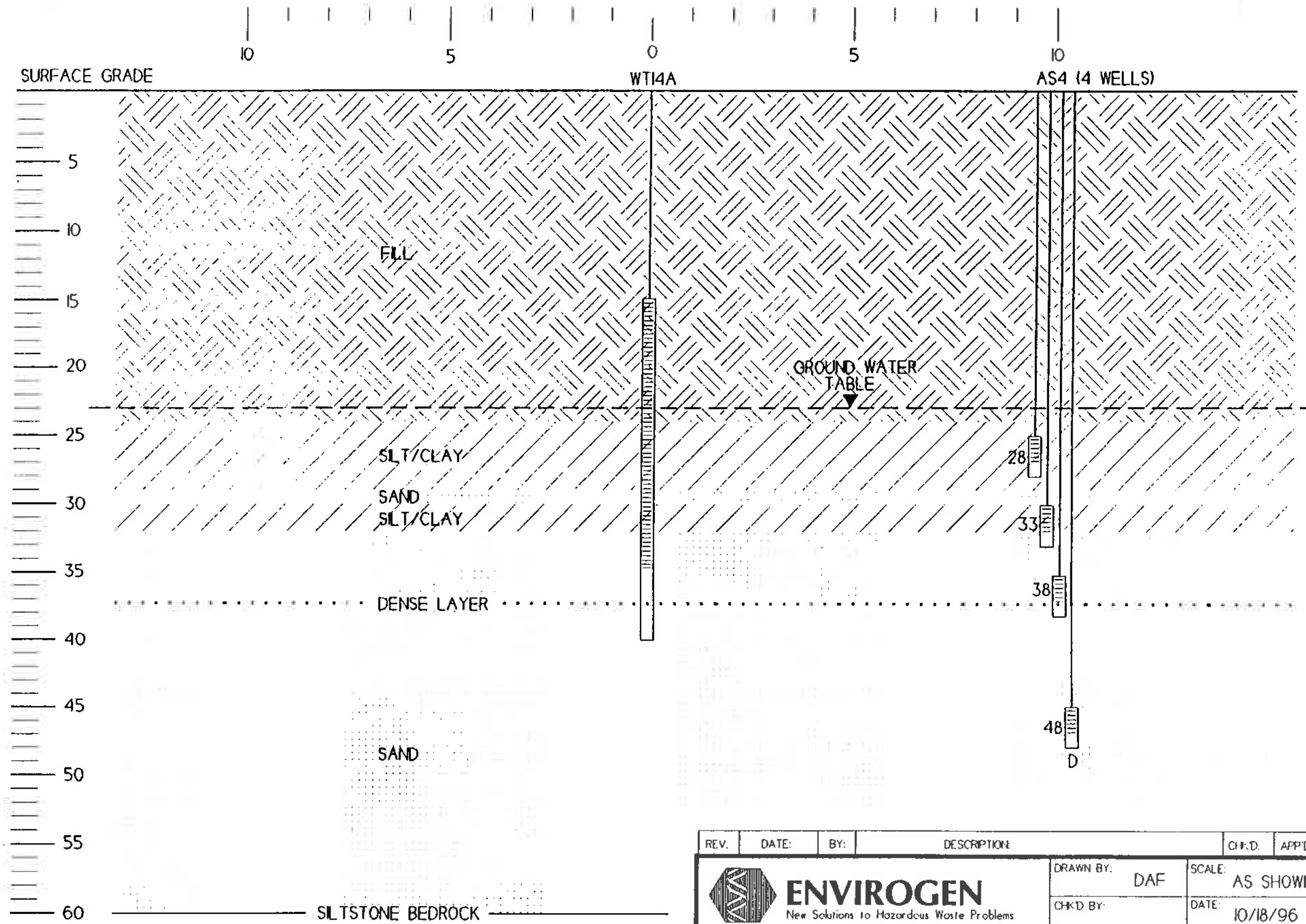


ENVIROGEN New Solutions to Hazardous Waste Problems	DRAWN BY: DAF	SCALE: 1" = 10'
	CHK'D BY:	DATE: 12/19/96
TITLE: FIELD DEMONSTRATION OXYGEN INJECTION SYSTEM DESIGN	ENVIROGEN PROJECT NO. 67400	
	SITE: MONSANTO COMPANY FLEXSYS FACILITY	
	SIZE: A	DRAWING NO. 67400-5 REV. 4



REV.	DATE:	BY:	DESCRIPTION:	CHK'D.	APP'D.

ENVIROGEN New Solutions to Hazardous Waste Problems	DRAWN BY: DAF SCALE: AS SHOWN CHK'D BY: DATE: 10/18/96
TITLE: CROSS SECTION A - A' SHOWING WELL DEPTHS	ENVIROGEN PROJECT NO. 67400
	SITE: MONSANTO COMPANY FLEXSYS NITRO PLANT
	SIZE: A DRAWING NO 67400-I REV.



REV.	DATE:	BY:	DESCRIPTION:	CHK'D.	APP'D.

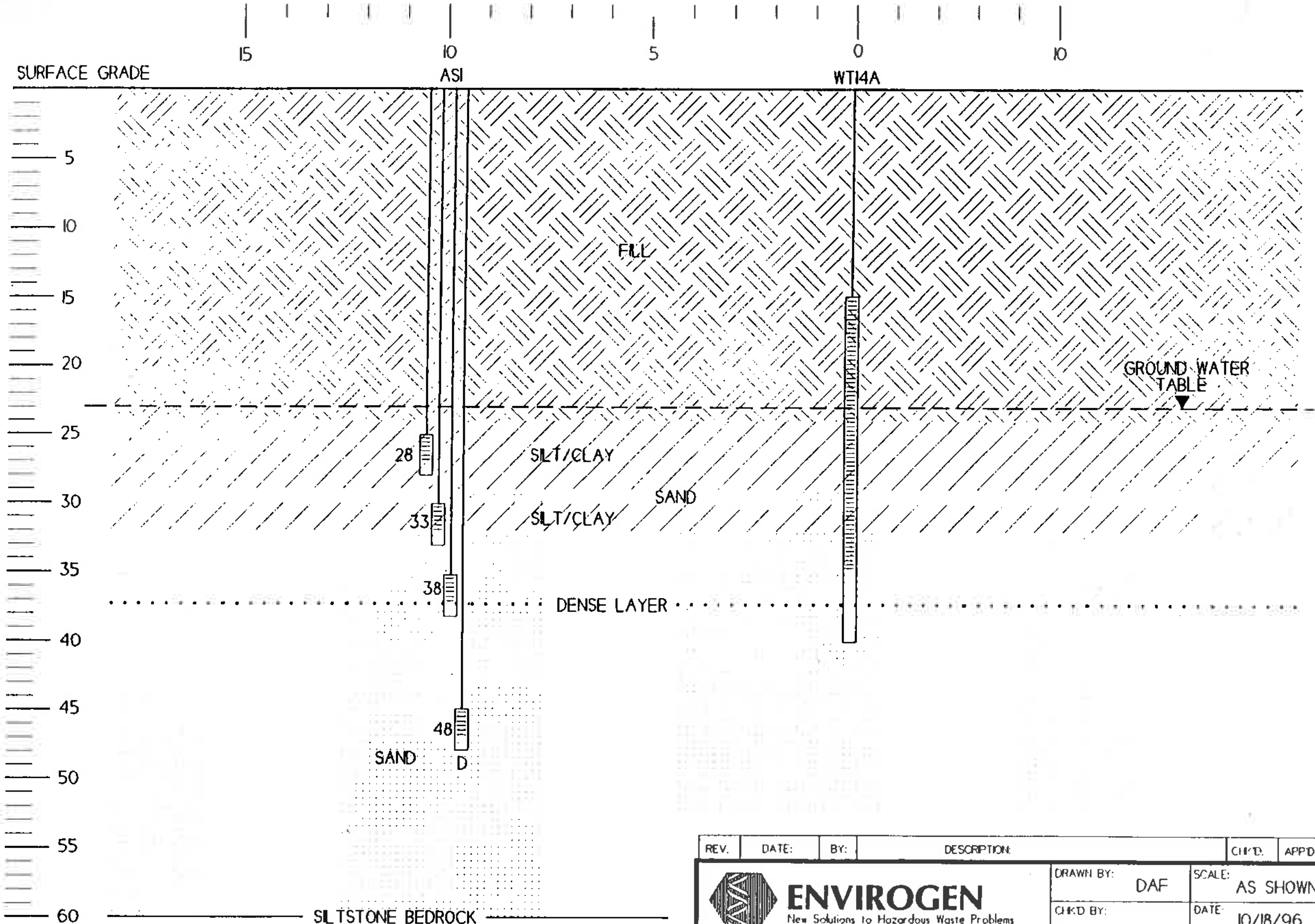
ENVIROGEN
New Solutions to Hazardous Waste Problems

DRAWN BY: DAF
SCALE: AS SHOWN
CHK'D BY:
DATE: 10/18/96
ENVIROGEN PROJECT NO. 67400

TITLE:
CROSS SECTION B-B'
SHOWING WELL DEPTHS

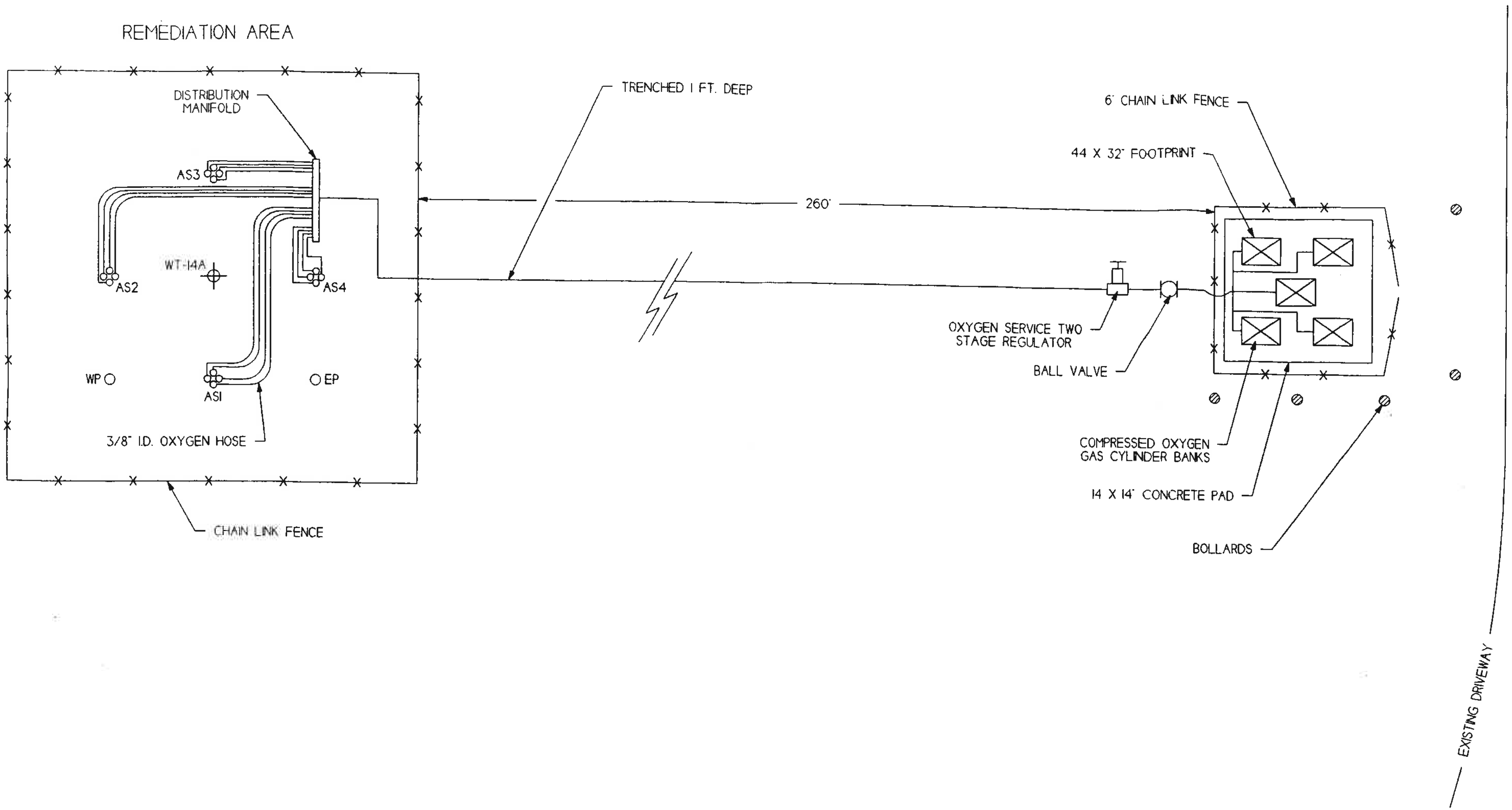
SITE: MONSANTO COMPANY
FLEXSYS NITRO PLANT

SIZE: A
DRAWING NO. 67400-2
REV



REV.	DATE:	BY:	DESCRIPTION:	CHK'D.	APP'D.

ENVIROGEN New Solutions to Hazardous Waste Problems	DRAWN BY: DAF	SCALE: AS SHOWN
	CHK'D BY:	DATE: 10/18/96
TITLE: CROSS SECTION C - C' SHOWING WELL DEPTHS	ENVIROGEN PROJECT NO. 67400	
	SITE: MONSANTO COMPANY FLEXSYS NITRO PLANT	
	SIZE: A	DRAWING NO. 67400-2A — REV.



REV.	DATE:	BY:	DESCRIPTION:	CHK'D.	APP'D.

ENVIROGEN
New Solutions to Hazardous Waste Problems

DRAWN BY: DAF	SCALE: NTS
CHK'D BY:	DATE: 12/31/96
ENVIROGEN PROJECT NO.	67400
SITE: FLEXSYS FACILITY NITRO, WV.	
SIZE: A	DRAWING NO. 67400-8 / REV.

TITLE: OXYGEN INJECTION SYSTEM LAYOUT SCHEMATIC

Figure 1 - Well # WT-14A Dissolved Oxygen, Total Phenolic Compound & Benzene Concentrations in Ground-Water vs. Time

APPENDIX M

City of Nitro Dump Area
Field Operations Monitoring Log

TABLE 1
GASEOUS OXYGEN INJECTION REMEDIATION SYSTEM (GOxIRS)
Oxygen Injection
Monsanto - Flexsys Nitro Plant, Nitro, West Virginia
ENVIROGEN Project No. 67400

Date	Total GOxIRS O_2 Flowrate (cfm)	Average O_2 Guage Pressure at Injection Well[1] (psig)	O_2 Flowrate[2] (scfm)	Volume O_2 Injected [3] ($feet^3$)	Cumulative Vol. O_2 Injected ($feet^3$)	Cumulative Mass O_2 Injected (LBs)
01/21/97	0.12	3.4 *	0.12	0	--	--
01/28/97	0.15	3.4	0.15	598	598	53
02/03/97	0.12	3.9	0.12	518	1,116	100
02/11/97	0.21	3.8	0.22	811	1,927	172
04/04/97	0.47	3.6	0.48	11,242	13,169	1,175
05/09/97	0.19	3.7	0.19	7,176	20,345	1,815
06/30/97	0.14	3.5	0.14	5,394	25,739	2,296
09/11/97	0.13	3.6	0.13	6,133	31,872	2,843
10/17/97	0.06	3.3	0.06	2,181	34,054	3,038
12/18/97	0.06	3.4	0.06	2,306	36,360	3,244
03/27/98	0.02	3.8	0.02	2,540	38,900	3,470
05/07/98	0.05	3.1	0.05	937	39,837	3,554
06/16/98	0.09	3.5	0.10	1,807	41,643	3,715
07/29/98	0.10	3.6	0.10	2,617	44,260	3,948

g:\proj\67400\dataeval\DATAEVAL.xls

Notes:

* = not measured - assumed equal to pressures read on following site check

[1] = average of pressures measured at all injection points - some of the readings were off the maximum guage reading (5 psi) and were assumed to be 5 psi for the purposes of obtaining an approximate average.

[2] = correction factor applied for oxygen flow at non-standard conditions (14.7 psia & 68 °F)

[3] = the GOxIRS system is injecting oxygen 43% of the time in a pulsed mode of operation.

Table 2. Summary of Gaseous Oxygen Injection Remediation System Readings for Monitoring Well WT-14A. Solutia Inc., Nitro, West Virginia.

Date	Dissolved Oxygen(1) (mg/l)	pH (S.U.)	RedOx Potential (mV)	Temperature (°F)	Specific Conductance(2) (mS/cm)	Ground-Water Elevation (ft. MSL)
09/19/96	NM	NM	NM	NM	NM	568.14
12/05/96	NM	NM	NM	NM	NM	571.82
01/21/97	0.4	8.29	20.6	59	NM	NM
02/03/97	7.11	8.37	183.7	60.5	NM	NM
02/11/97	13.6	8.3	182.8	60.3	NM	563.57 (4)
03/03/97	NM	NM	NM	NM	NM	572.05
04/04/97	1.86	8.14	28.7	61.8	17.42	571.85
05/09/97	6.89	8.09	151.5	16.9	15.36	570.44
06/17/97	NM	NM	NM	NM	NM	568.84
06/30/97	21.65	8.17	183.9	62.3	1,277	568.29
09/09/97	NM	NM	NM	NM	NM	567.78
09/11/97	12.03	7.84	222.8	62.5	1,007	567.78
10/17/97	6.8	7.37	275.9	62.4	NM	567.18
11/20/97	NM	NM	NM	NM	NM	566.98
12/09/97	9.61	6.93	NM	NM	1,110	NM
12/18/97	8.83	7.51	228	57	1,230	567.16
12/23/97	7.39	7.22	NM	NM	1,250	NM
01/06/98	9.57	7.08	NM	NM	1,150	NM
01/15/98	5.11	6.53	NM	NM	1,275	NM
01/23/98	7.98	6.91	NM	NM	3,670	NM
01/29/98	19.8	7.29	NM	NM	3,520	NM
02/11/98	10.02	7.1	NM	NM	3,490	NM
02/18/98	NM	NM	NM	NM	NM	571.95
02/20/98	9.04	7.16	NM	NM	3,390	NM
02/25/98	9.59	7.28	NM	NM	3,450	NM
03/06/98	8.98	7.3	NM	NM	3,225	NM
03/12/98	10.21	7.1	NM	NM	3,510	NM
03/20/98	8.12	6.98	NM	NM	3,485	NM
03/27/98	2.89	7.71	87.5	64.2	3,560	572.16
04/02/98	1.23	7.9	NM	NM	3,480	NM
04/08/98	2.2	7.34	NM	NM	3,510	NM
04/14/98	0.91	7.99	NM	63.7	2,980	571.42
04/15/98	0.53	7.56	NM	NM	3,525	NM
04/23/98	0.52	7.39	NM	NM	3,505	NM
04/27/98	0.52	NM	NM	NM	NM	NM
04/27/98 (3)	15.7	NM	NM	NM	NM	NM
04/28/98	0.58	7.98	NM	NM	3,580	NM
05/07/98	0.43	7.86	77.3	63.5	3,540	571.64
05/07/98 (3)	0.6	7.74	126.3	63.7	NM	NM
05/13/98	0.57	7.26	NM	NM	3,250	NM
05/22/98	0.63	7.31	NM	NM	3,230	NM
06/03/98	0.42	7.01	NM	NM	3,195	NM
06/16/98	3.77	8.74	161	63.3	3,160	571.72
06/25/98	NM	NM	NM	NM	NM	571.87
06/26/98	1.49	7.8	NM	NM	3,240	NM

Table 2. Summary of Gaseous Oxygen Injection Remediation System Readings for Monitoring Well WT-14A. Solutia Inc., Nitro, West Virginia.

Date	Dissolved Oxygen[1] (mg/l)	pH (S.U.)	RedOx Potential (mV)	Temperature (°F)	Specific Conductance[2] (mS/cm)	Ground-Water Elevation (ft. MSL)
07/06/98	1.12	7.61	NM	NM	3,390	NM
07/21/98	1.98	7.44	NM	NM	3,020	NM
07/29/98	0.62	7.7	85.3	63.7	2,970	570.90
10/06/98	NM	NM	NM	NM	NM	567.21
10/27/98	20 [5]	7.4	NM	66.02	12.72	566.98
11/06/98	20 [5]	7.33	NM	61.52	11.3	567.14
11/12/98	20 [5]	7.34	NM	60.62	8.79	566.55
11/25/98	11.05	7.51	NM	62.6	9.97	566.67
12/04/98	NM	NM	NM	NM	NM	566.74
12/10/98	19.3	7.23	NM	62.96	8.92	566.78
12/21/98	4.98	NM	NM	NM	NM	NM
01/12/99	NM	7.42	NM	62.6	9.07	566.90
01/21/99	4.61	7.02	NM	62.96	8.99	566.84

Abbreviations

mg/l = milligrams per liter
S.U. = Standard units
mV = millivolts
°F = Degrees Fahrenheit
mS/cm = milliseconds per centimeter
ft. MSL = feet above Mean Sea Level

Footnotes

(1) Dissolved oxygen readings collected after 7/29/98 are readings taken after well purging.
(2) Specific conductance readings collected prior to 1/23/98 may be low due to a fualty meter.
(3) Readings collected after well pumping and surging for the date shown.
(4) Measurement appears to be in error.
(5) Instrument indicated dissolved oxygen readings as ">20 mg/l".

Table 3. Gaseous Oxygen Injection Remediation System Vapor Head Space Data for Monitoring Well WT-14A. Solutia Inc., Nitro, West Virginia.

Date	Percent O2 (%)	Percent CO2 (%)	Percent CH4 (%)	Non-CH4 VOC's (ppmv)
01/21/97	10.4	ND	0.7	150
01/28/97	14.8	ND	ND	1.1
02/03/97	18.5	ND	ND	37
02/11/97	20.2	ND	ND	76
04/04/97	21.3	ND	0.3	NM
05/09/97	24.4	ND	0.6	0.6
06/30/97	22.4	ND	0.6	0.5
09/11/97	21.6	ND	ND	ND
10/17/97	20.9	0.1	ND	ND
12/18/97	21.2	0.1	ND	ND
03/27/98	11.3	0.2	0.2	0.2
05/07/98	23.4	ND	0.6	0.2
06/16/98	21.9	ND	ND	ND
07/29/98	22.3	ND	ND	ND
10/27/98	NM	NM	NM	NM
11/06/98	NM	NM	NM	NM
11/12/98(1)	34.6	0.5	0	NM
11/25/98(2)	NM	NM	NM	NM
12/10/98(3)	31.1	0.7	0	NM
12/10/98(4)	NM	NM	NM	NM
12/10/98(5)	NM	NM	NM	NM
12/10/98(6)	NM	NM	NM	NM

Abbreviations

ND = milligrams per liter
NM = Not Measured

Footnotes

(1)= Injection suspended at 1520 hrs.

(2)= O_2 injection restarted at rate of 1.0-1.5 ft^3/hr - 1745 hrs.

(3)= Injection suspended at 1650 hrs.

(4)= O_2 injection restarted at rate of 1.0-1.5 ft^3/hr - 1510 hrs.

(5)= Injection suspended at 1730 hrs.

(6)= O_2 injection restarted at rate of 1.0 ft^3/hr - 1510 hrs - New O_2 bank at 2200#.

TABLE 4
GASEOUS OXYGEN INJECTION REMEDIATION SYSTEM (GOxIRS) - Laboratory Analyses
BOD, COD, Dissolved Gases and Nutrients - Monitoring Wells WT-14A & WT-13A

Monsanto - Flexsys Nitro Plant, Nitro, West Virginia

ENVIROGEN Project No. 67400

Nutrients and pH Analytes	09-Sep-97	20-Nov-97	19-Feb-98	26-Jun-98
Nitrogen - Ammonia (NH_3)	421	81.1	29.5	52.5
Nitrogen - NO_2, NO_3	67.1	23.5	58	6.87
Total Kjeldahl Nitrogen (TKN)	568	105	34.2	67.8
Total Phosphorus	1.5	0.7	0.89	0.71
Orthophosphates	0.48	0.55	0.44	0.19
pH	7.54	6.7	7.67	7.83

Well Location	BOD (5-day) (mg/L)	COD (mg/L)
WT-13A Sample Date: 9/26/1997	2	29
WT-14A Sample Date: 9/26/1997	18	130

Dissolved Gases (WT-14A)	15-Apr-98	12-May-98
Dissolved Oxygen	4.4	7.5
Free Carbon Dioxide	nm	12.8

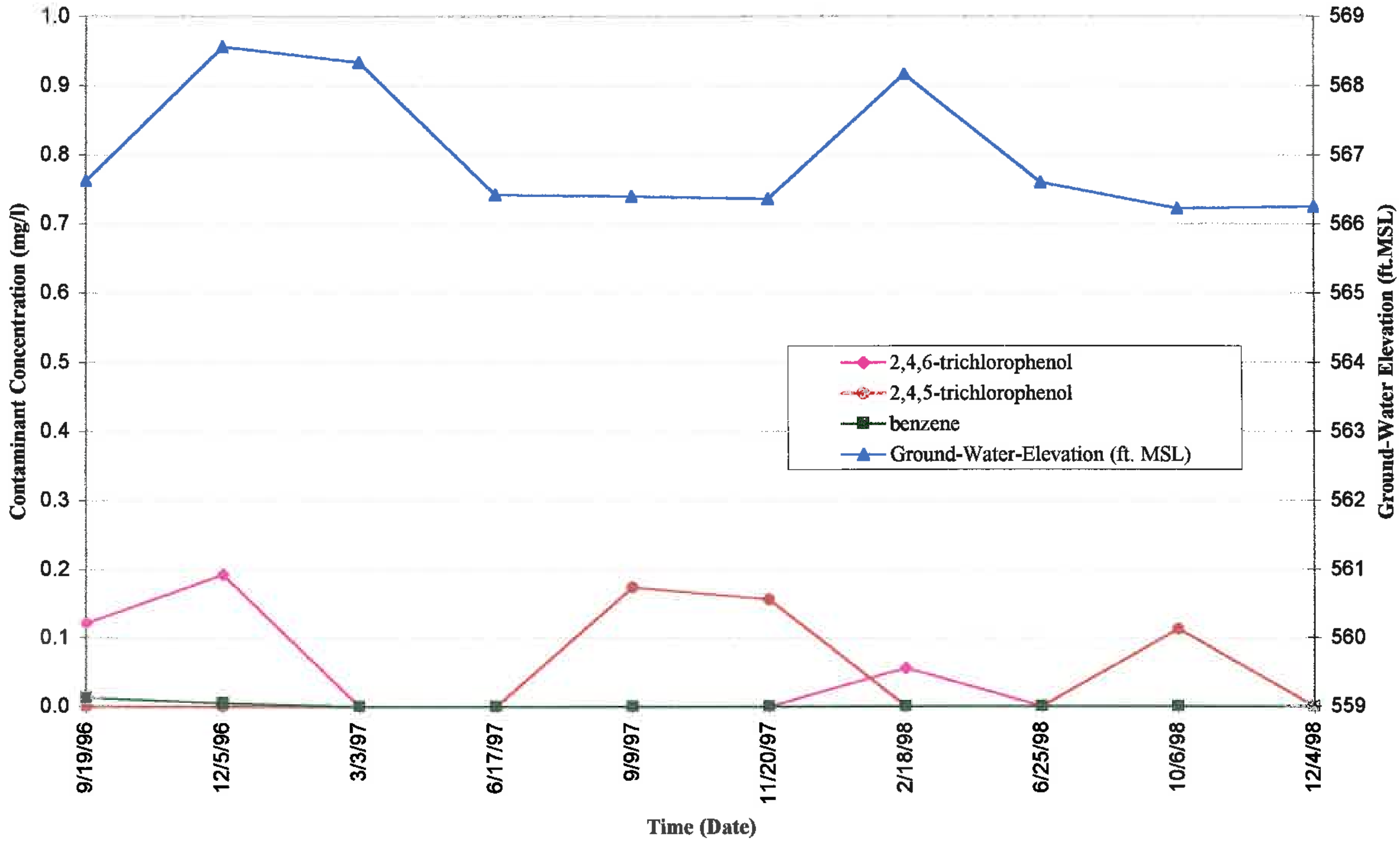
g:\proj\67400\dataeval\DATAEVAL.xls

Notes:
Nutrient concentrations in mg/L
pH in pH units
BOD, COD samples collected on September 26, 1997

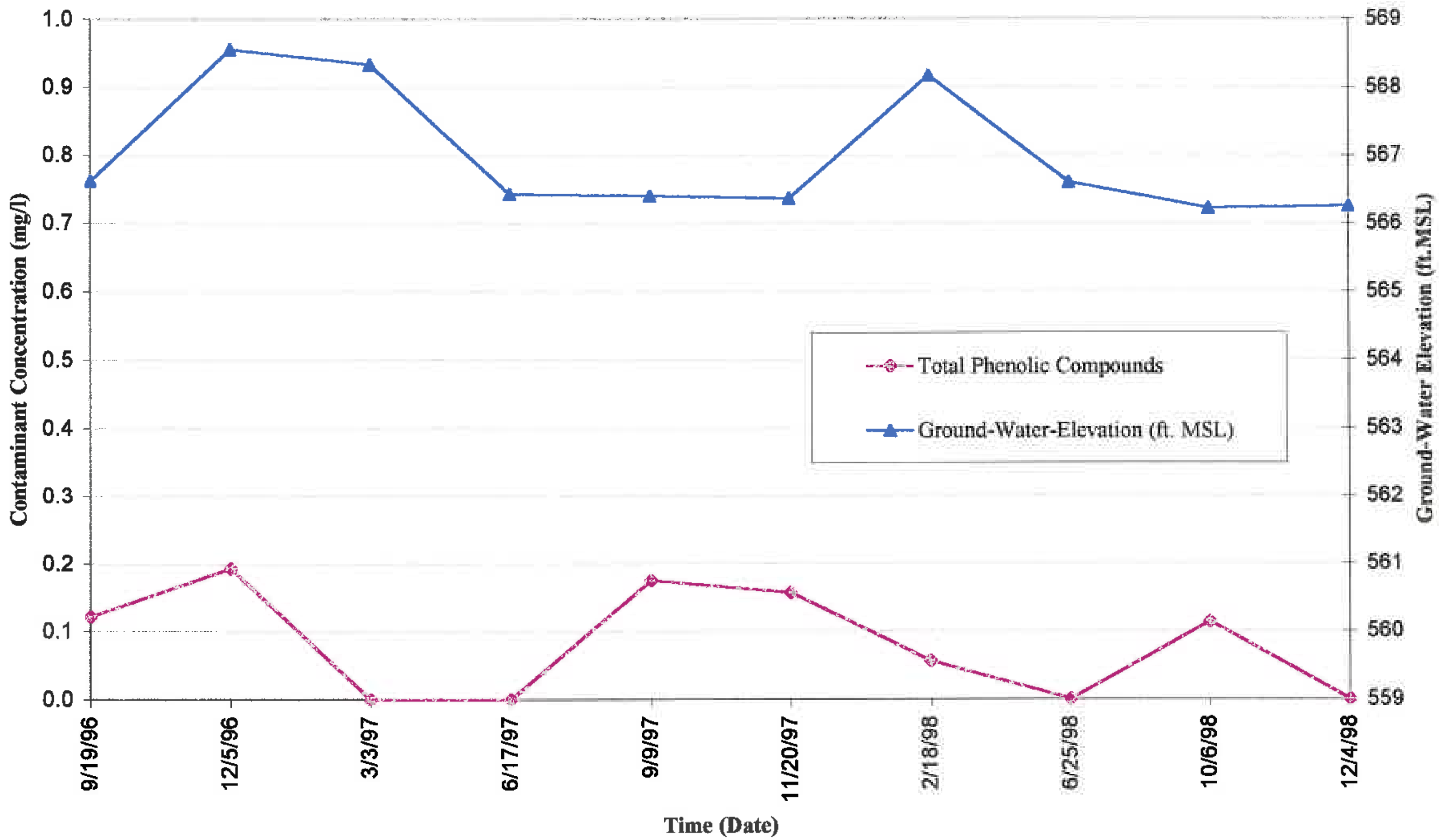
APPENDIX N

CITY OF NITRO DUMP AREA
MONITORING WELL
CONCENTRATION TRENDS

WT-13A Contaminant Concentration & Ground-Water Elevation vs. Time



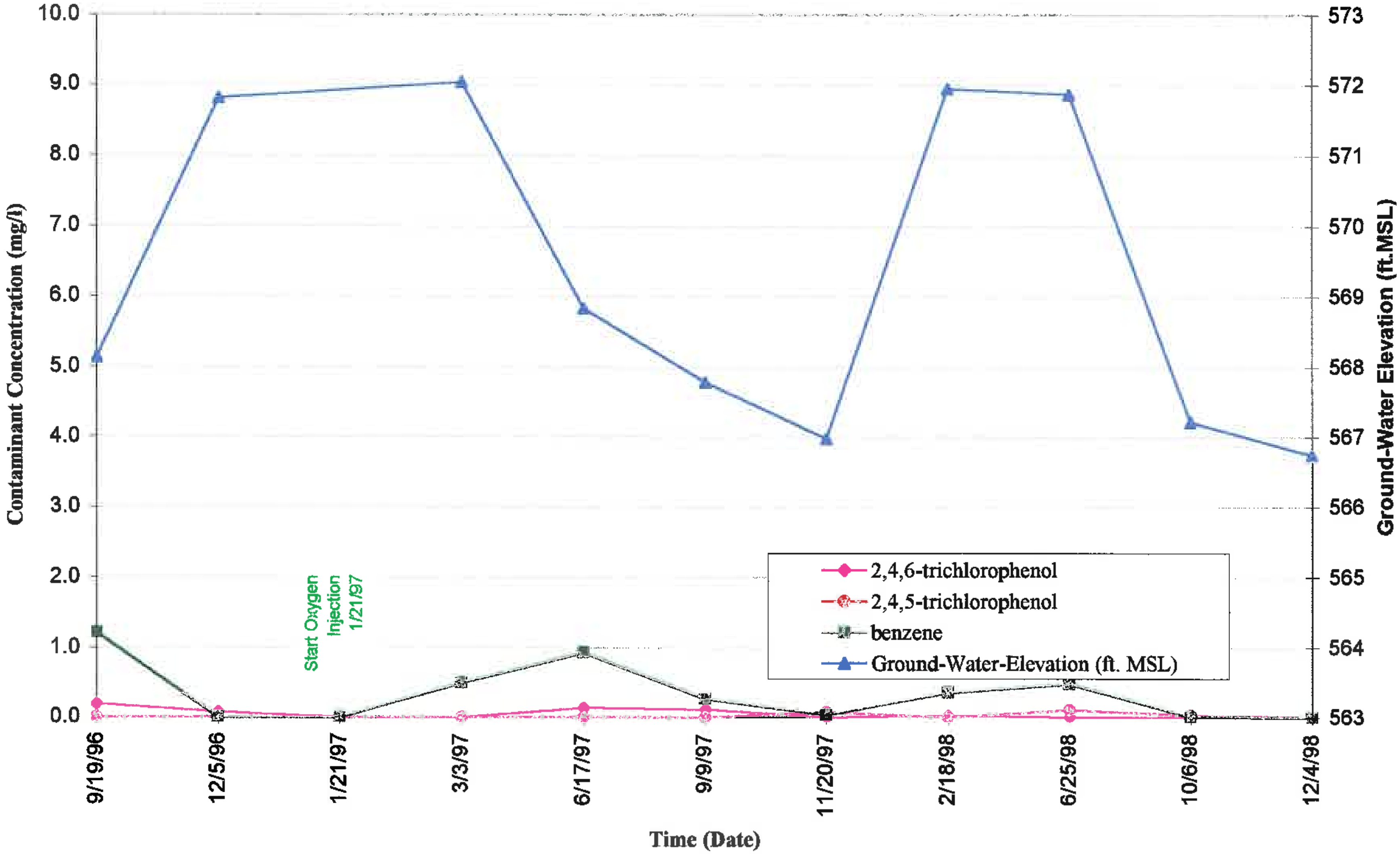
WT-13A Total Phenolic Compound Concentration & Ground-Water Elevation vs. Time



ROUX ASSOCIATES INC

MO06619J08.56

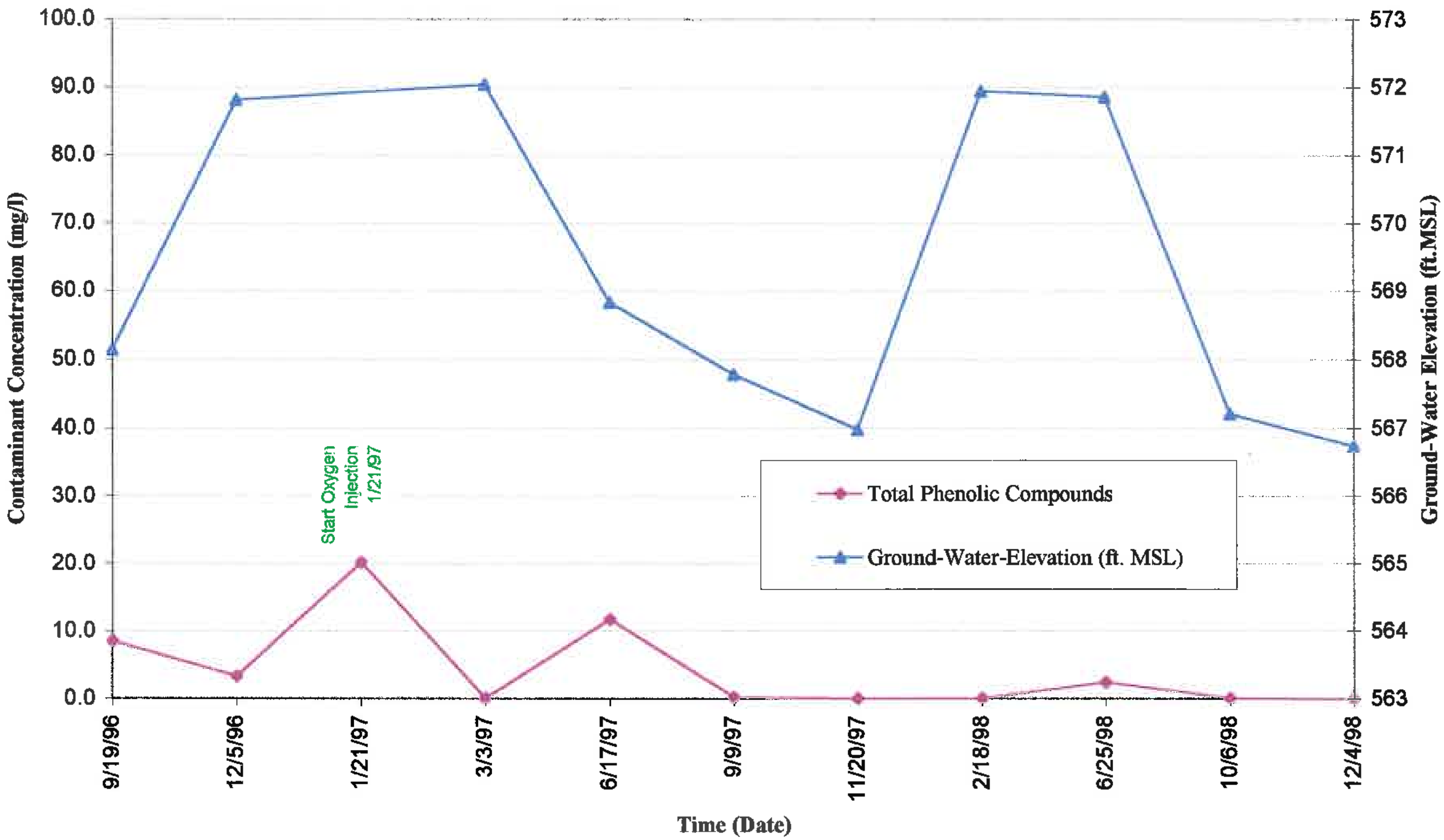
WT-14A Contaminant Concentration & Ground-Water Elevation vs. Time



ROUX ASSOCIATES INC

MO06619J08.56

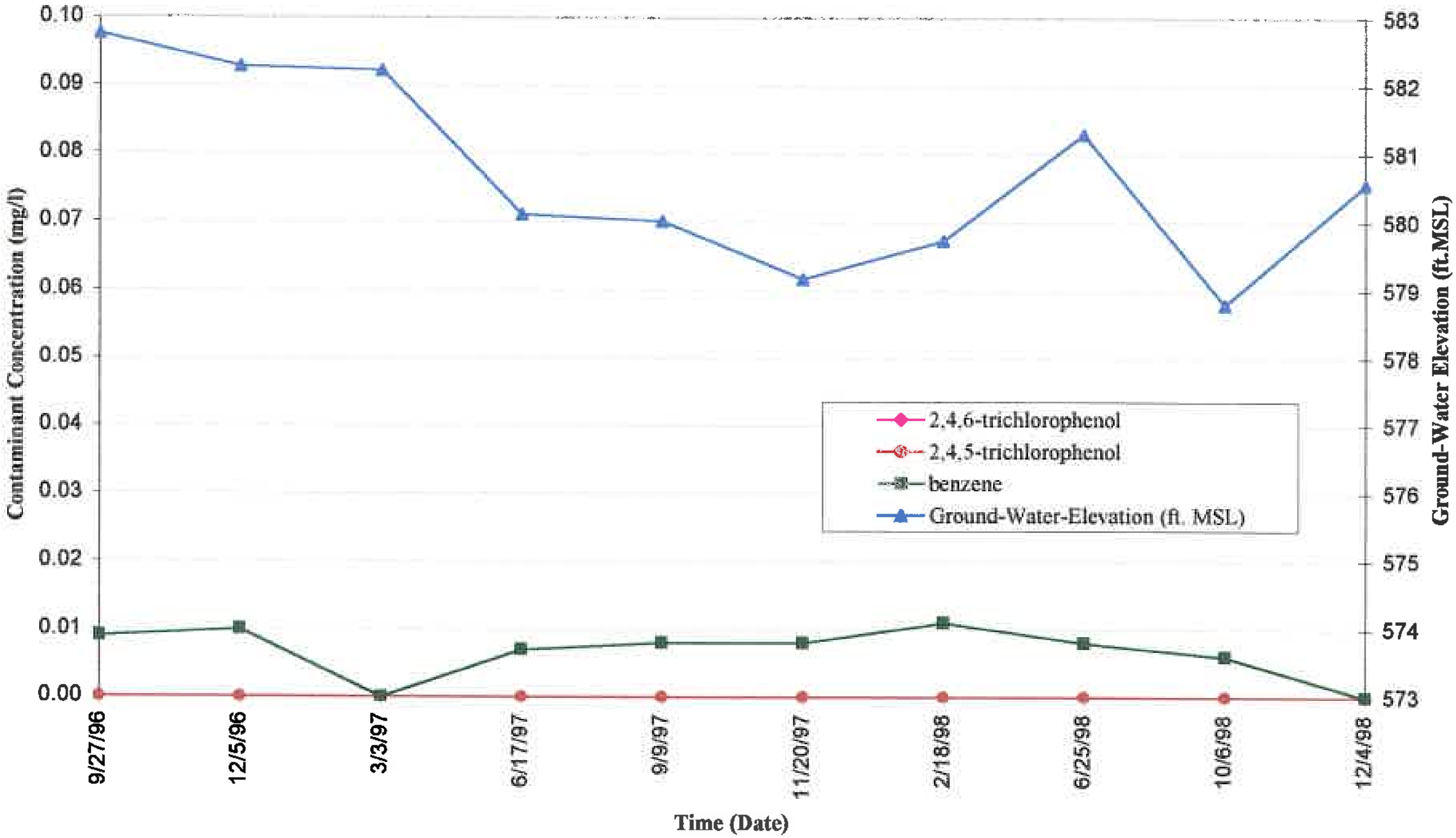
WT-14A Total Phenolic Compound Concentration & Ground-Water Elevation vs. Time



ROUX ASSOCIATES INC

MO06619J08.56

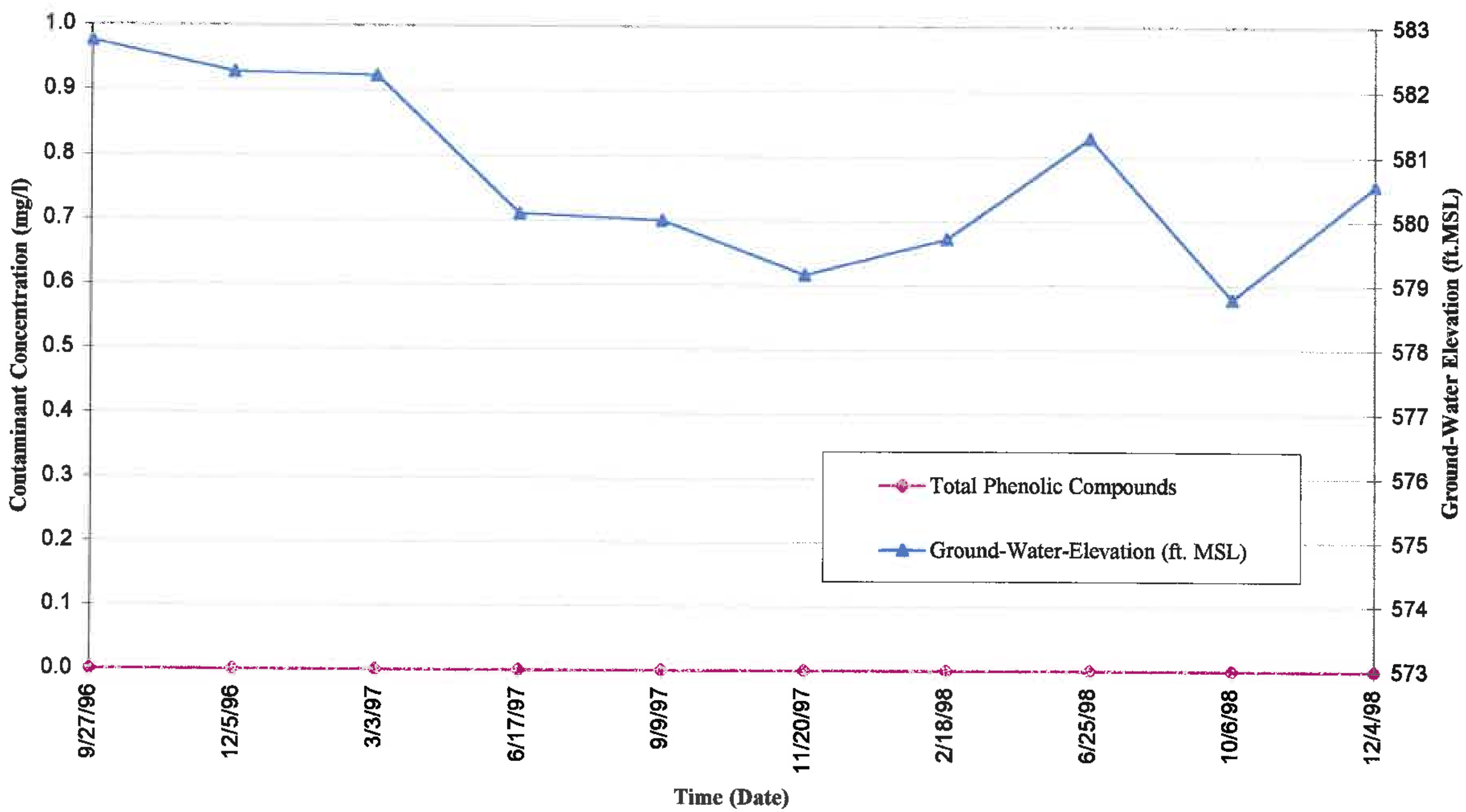
WT-15A Contaminant Concentration & Ground-Water Elevation vs. Time



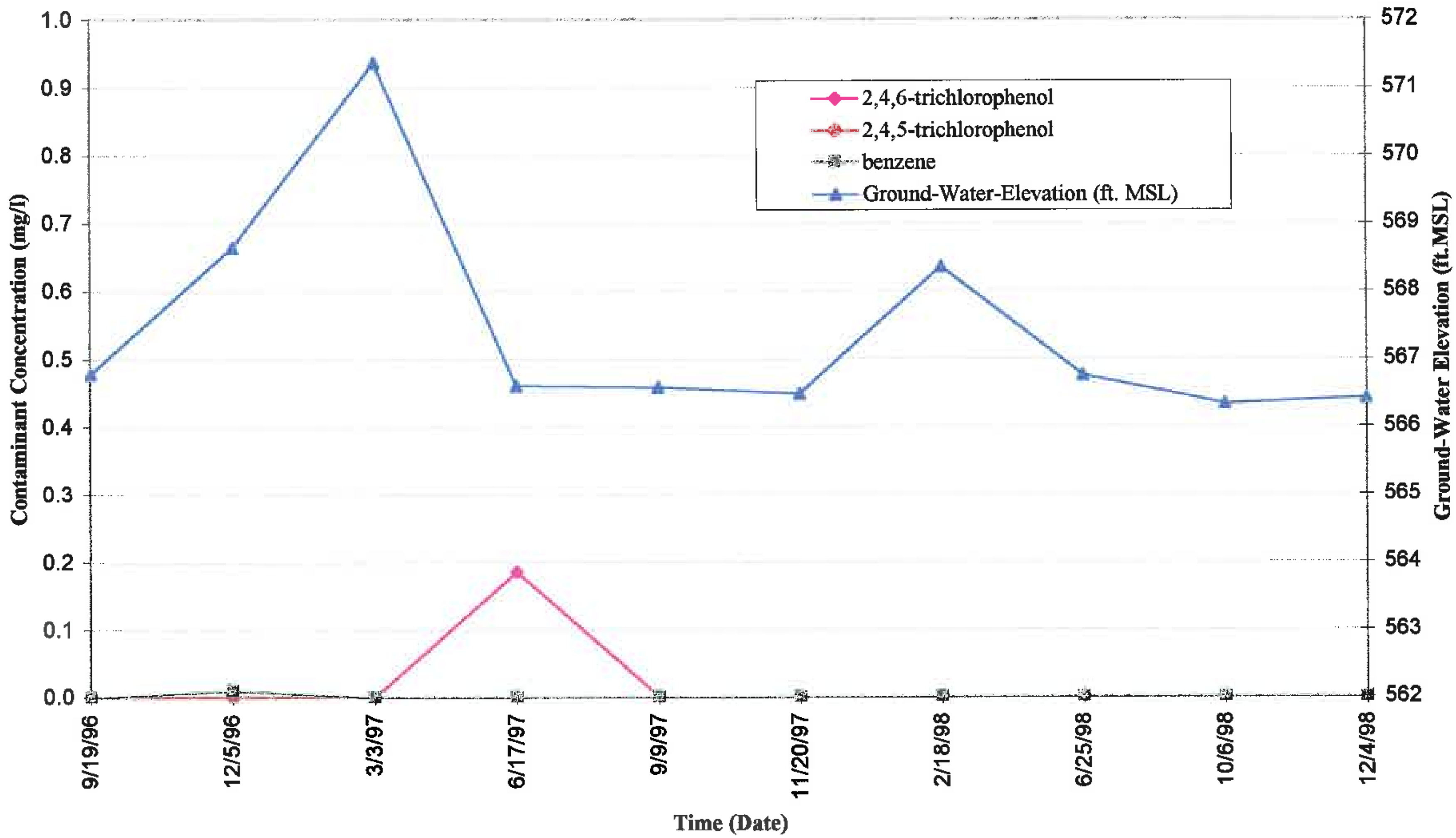
ROUX ASSOCIATES INC

MO06619J08.56

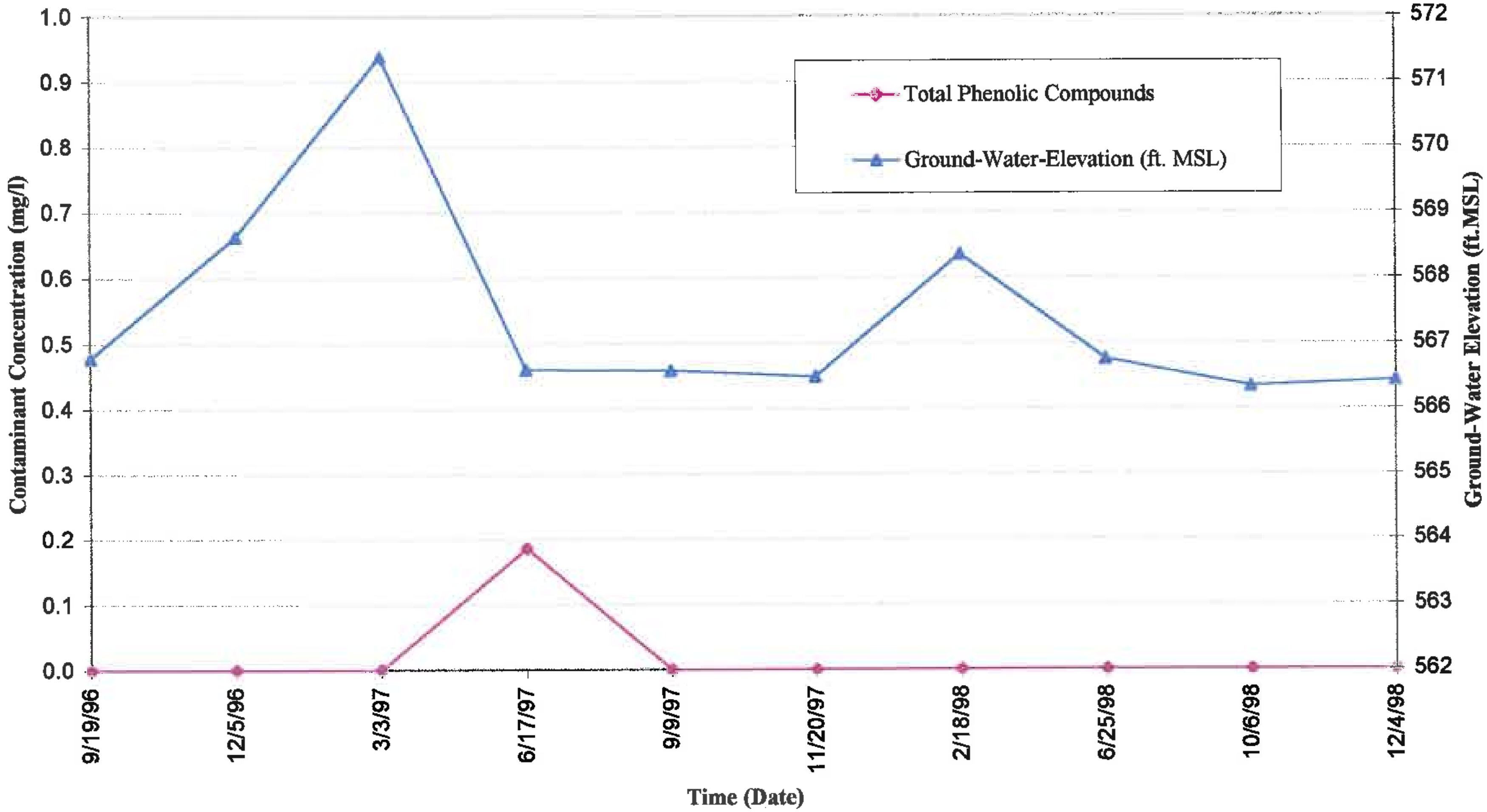
WT-15A Total Phenolic Compound Concentration & Ground-Water Elevation vs. Time



TD-5 Contaminant Concentration & Ground-Water Elevation vs. Time



TD-5 Total Phenolic Compound Concentration & Ground-Water Elevation vs. Time



PLATES

REFERENCE

1.) TOPOGRAPHIC MAP BASED ON SURGE BASIN A3 RECORD DRAWING BY POTESTA & ASSOCIATES, DATED JANUARY 1999.

100' 0' 100'

Title:

BASIN CLOSURE AS-BUILTS

NITRO, WEST VIRGINIA

Prepared For: SOLUTIA

ROUX ASSOCIATES INC Environmental Consulting & Management	Compiled by: W.B.S.	Date: 01/08/99	Plate
	Prepared by: J.S.G.	Scale: SHOWN	1
	Project Mgr: P.J.P.	Revision:	
	Proj No: 06619J08	File No: 06619144	